BIOLOGICAL ASSESSMENT OF
THE EAST SADDLE PROJECT

North Fork Ranger District
Nez Perce-Clearwater National Forests
Orofino, Idaho

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I. INTRODUCTION

This document is a Biological Assessment (BA) for Endangered Species Act (ESA)-listed species which evaluates the potential effects of the proposed East Saddle (ES) project on aquatic, wildlife, and plant species with ESA status. The North Fork Ranger District will obtain all necessary Clear Water Act permits for the proposed activities, and intends that this BA should be sufficient to meet the Section 7 requirements of the Corps of Engineers and any other Federal agency.

The North Fork District, Nez Perce-Clearwater National Forests is proposing to conduct vegetation treatments and road work in the Lower Kelly, Lower Cayuse, Elizabeth Creek-North Fork and Deadwood-Moose subwatersheds of Clearwater County, Idaho (Figures 1, 16). The legal description of the activity area is portions of Township 38 N and 39 N, Range l0 E and 11 E. Implementation of regeneration harvest and associated roadwork would begin as early as 2020 and would continue for several years, while fuel/elk habitat treatments would be implemented as early as 2020 and might continue through the following decade.

II. SPECIES ANALYZED

Species considered in this analysis include species listed as Threatened or Endangered under the ESA as well as candidates for Federal listing as Threatened or Endangered in the project area.

The USFWS' IPaC online program (accessed on 1 February 2019) includes four listed, proposed, or candidate species: Canada lynx, bull trout, wolverine, and whitebark pine deemed to be present in the vicinity of the project area. The USFWS species list for Clearwater County, Idaho (also accessed online on 1 February 2019), states the presence of other species with ESA status "known to or are believed to occur" in the county, including grizzly bear, gray wolf, and one threatened plant species, Spalding's Catchfly, but, except for grizzly bear, effects on these non-IPaC species are not analyzed in this document. No evidence exists that any other listed, proposed, or candidate species may occur in the project area.

NOAA Fisheries does not provide routine county- or Forest-specific ESA-relevant species lists, but shows maps on its website that includes Snake River steelhead and Snake River fall Chinook salmon as present within portions of the Clearwater National Forest.

Table 1 lists each of the ESA-status species. For each species, this table provide information on occurrence, habitat, whether the species is considered in detail, and an effects determination. The primary references for information on species not considered in detail are Nez Perce-Clearwater N.F. files and the Idaho Conservation Data Center (ICDC, now IFWIS, IDFG 2014).

III. DESCRIPTION OF PROPOSED PROJECT

This project area (Figure 1) encompasses approximately 25,300 acres, and is composed completely of National Forest System land managed by the North Fork Ranger District. Additional details about the project area are provided in Section V. The primary purpose of this project is to improve terrestrial wildlife habitat by creating openings and promoting better browse for ungulate species such as elk, and maintaining or increasing aspen stands. In doing so, the proposed action and associated design criteria will also improve vegetative conditions by increasing resiliency to insect and disease, reduce fuel loading and potential for crown fires in treatment areas, improve road conditions in the project area which will decrease erosion and subsequent sediment delivery to streams, and provide opportunities for income and employment by providing forest products from National Forest System lands.

Species	Status*	Considered in Detail	Effects Determination**	Rationale
Snake River steelhead trout *Oncorhynchus mykiss gairdneri*	T	No	NE	Native to the larger streams in the project area, but blocked by Dworshak Dam for 40+ years.
Snake River fall Chinook salmon *Oncorhynchus tshawytcha*	T	No	NE	Native to Clearwater River, but blocked from all but the lowest 1 mile of the NF Clearwater River (NFCR) by Dworshak Dam for 40+ years
Bull trout *Salvelinus confluentus*	T	Yes	NLAA	Native and present in the NFCR and many of its tributaries, including the mainstems of Kelly, Moose, and Cayuse creeks. While no spawning or early rearing habitat is present in the project area, such habitat does exist in the headwaters of the streams noted above, so, adult and subadult bull trout are present in these streams essentially year-around (USFWS 2015, Hanson et al. 2014).
Bull trout Critical Habitat	n/a	Yes	NLAA	"Foraging, Migratory, and Overwintering" (FMO) CH has been designated in the project area reaches of the mainstems of the NFCR, Kelly Creek, and Cayuse Creek, while the ~1 mile portion of lower Moose Creek has been designated as "Spawning and Rearing" (SR). The SR designation of lower Moose Creek appears to be erroneous, given habitat (especially water temperature) conditions during typical spawning seasons.
Canada lynx *Lynx canadensis*	T	Yes	NLAA	Project area includes portions of LAU12, 17, 18, and 19 which have modeled suitable habitat. No critical habitat been designated on the Forest. The project would meet all NRLMD standards and guidelines. The Forest is considered occupied, so dispersing individuals could be present, but project activities would not affect their reproduction or survival.
North American Wolverine *Gulo gulo*	PT	Yes	NLJ	The project will not contribute to the identified primary or secondary threats to the wolverine DPS. None of the proposed activities are considered a threat to the DPS. Individual project activities and cumulative actions will result in relatively small-scale disturbances in relation to the large wolverine home range size. The Project would not result in barriers to dispersing individuals.
Grizzly Bear *Ursus arctos*	T	Yes	NE	Grizzly are unlikely to be residents of the area and the Forest is not recognized as having any occupied habitat or habitat that is necessary for the recovery of the species.
Whitebark pine *Pinus albicaulis*	C	Yes	NE	Typically found in Idaho on high elevation ridges; present on Clearwater N.F., but typically not below about 7,000 feet above msl. Proposed harvest sites top out at about 5,500 feet, so no individuals should be present in the project area.

***Status Abbreviations:** T = ESA Threatened, P = ESA Proposed, C = ESA Candidate.
****Threatened and Candidate Species Determination:** NE = No Effect; NLAA = Not Likely to Adversely Affect, NLJ = Not Likely to Jeopardize

Table 1. ESA-listed Species Considered and Effects Determinations.

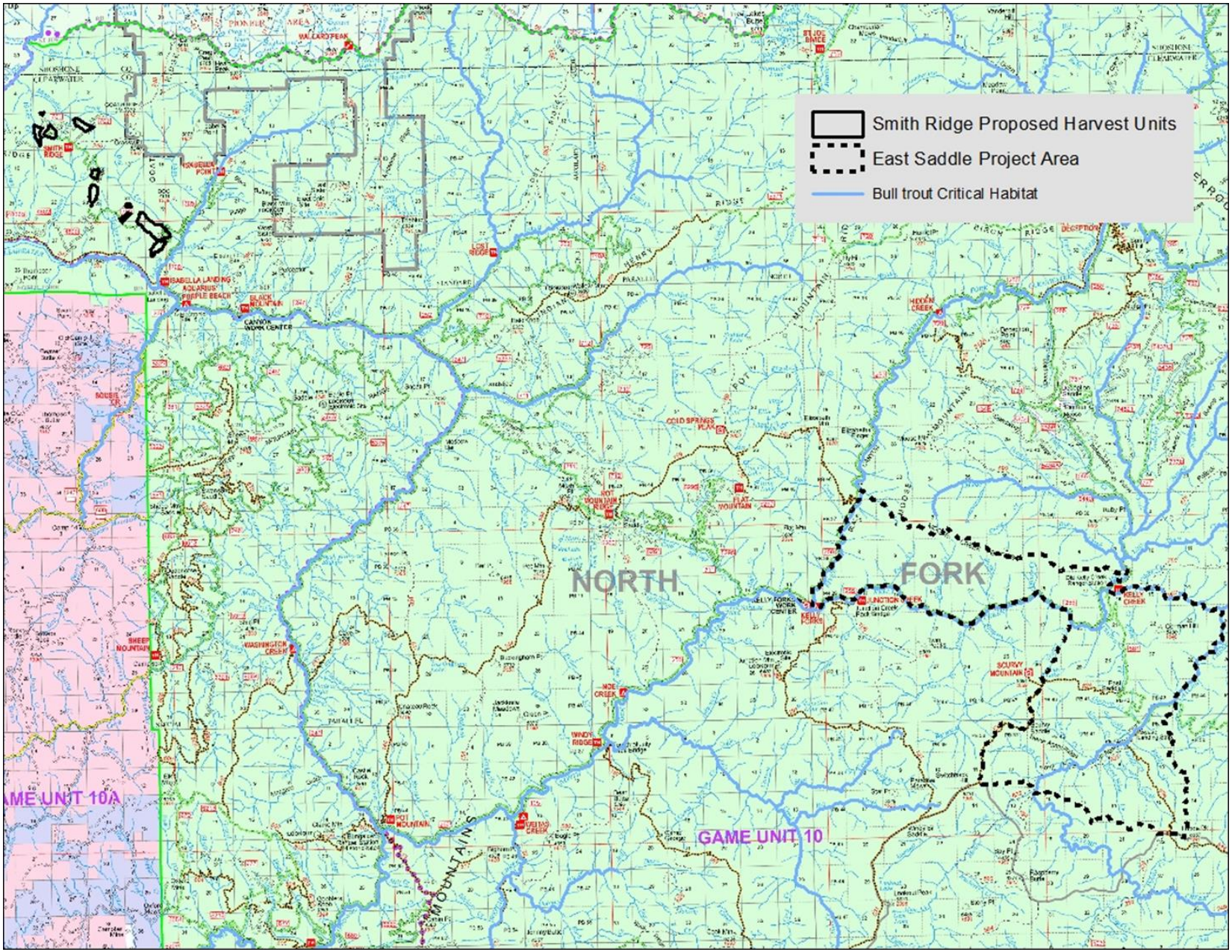


Figure 1. East Saddle and Smith Ridge projects vicinity map.

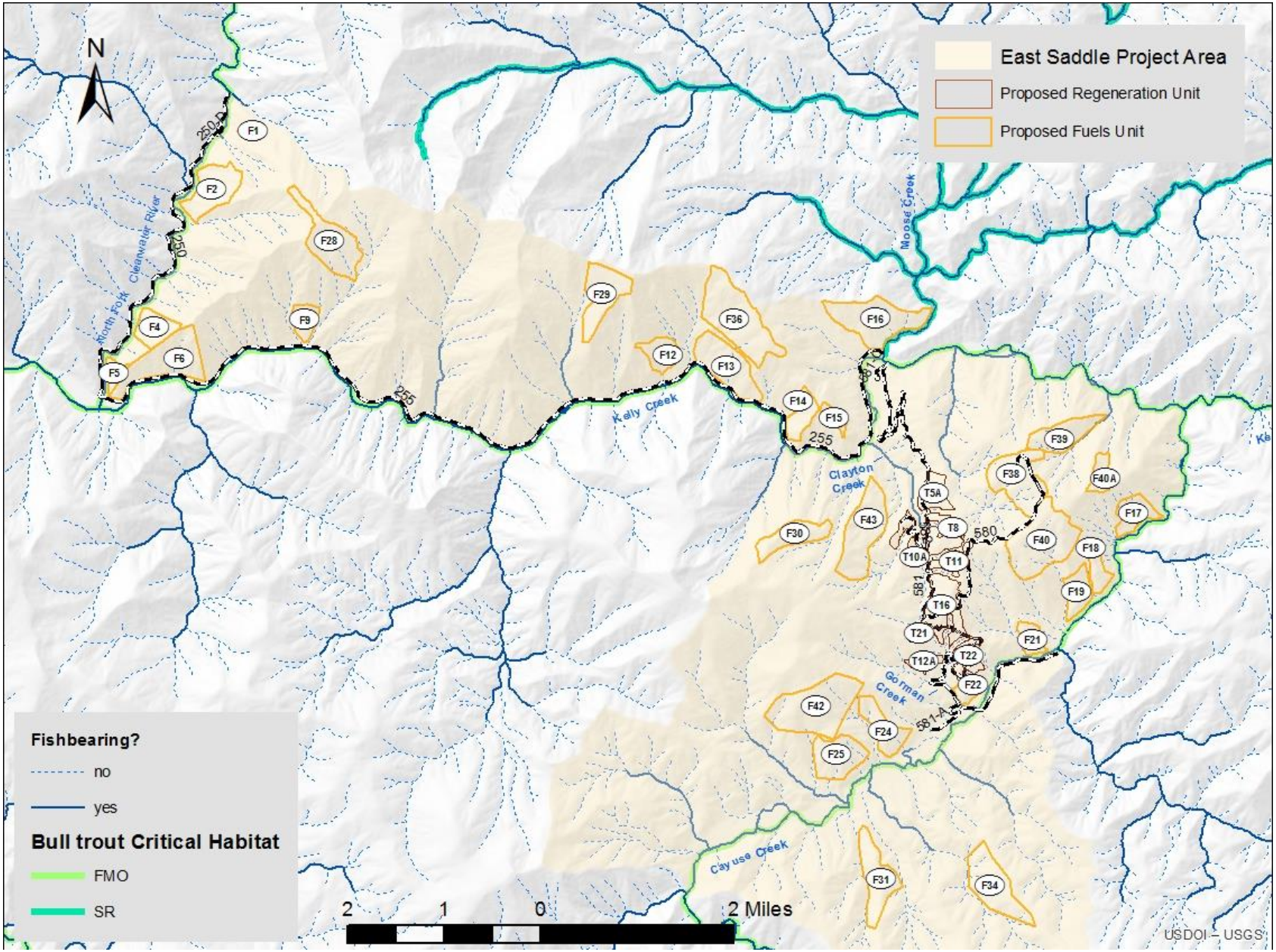


Figure 2. East Saddle project area with vegetation treatment units (see Tables 3 and 4), roads, and stream information.

Table 2 – Summary of Proposed Activities

Activity	Quantity
Regeneration Harvest	401 acres
Fuels/Elk Habitat Treatment	3435 acres
Temporary Road Construction	2.8 miles
Permanent Road Construction	0 miles
Road Reconstruction – System Road	11.1 miles
Culverts to construct/replace on fishbearing streams (up to)	5
Culverts to construct/replace on non-fishbearing streams (up to)	13
Culverts to remove on non-fishbearing streams (up to)	6
Road Abandonment/decommissioning – System Road	1.6 miles
Road Storage—System Road	0.8 miles
Log Haul – Project Area System Road	9.0 miles
Log Haul – Outside Project System Road (in Idaho and within NP-CNF boundaries)	57.5 miles (west) or 26.5 miles (east)

In order to meet the purpose and need stated above, the District is proposing a combination of commercial and non-commercial vegetation treatments, prescribed burning activities, and road work on National Forest System lands in portions of Township 38 N and 39 N, Range l0 E and 11 E (Tables 2, 3 and Figures 2, 3, and 4) as follows:

- Conduct regeneration harvest on 415 acres using a combination of clearcut w/ reserves, seed tree with reserves, and shelterwood with reserves (Tables 2, 3, and 4, Figures 2 and 3). After harvest, activity fuels would be piled and burned, masticated, or left un-piled and broadcast burned to prepare the harvest areas for planting.
- Conduct prescribed fire and hand and/or mechanical fuels treatments on 3,421 acres (Tables 2, 3, and 4, Figures 2 and 3) to elicit early successional patches of vegetation across the landscape. In units where aspen is present (Table 4), chainsaws may be used to cut and fell the mature aspen and/or competing conifers within or adjacent to the clone to promote regeneration of the aspen.
- Construct about 2.8 miles of new temporary roads, along or near ridge tops with no stream crossings, to facilitate timber harvest operations. These roads would be decommissioned to eliminate erosion potential, typically within 3 years of construction. The road prism would be decompacted and re-vegetated, and slash, stumps, or other woody debris would be placed and scattered uniformly on top of the re-contoured corridor to facilitate vegetation growth.
- Perform road reconstruction on 1.4 miles of Road #580, 8.9 miles of Road #581, and 0.8 miles of Road #582 to facilitate vegetative treatment activities. Place the 0.8 miles of Road #582 at Clayton Creek into long-term storage upon completion of activity fuel treatment.
- Allow haul of timber on Forests roads outside of the project area, either to the west on the 250 road (leaving the Forests near Pierce, Idaho) or to the east on the 255 and 250 roads (leaving the Forests at Hoodoo Pass, and there entering the Lolo National Forest and on to the vicinity of Superior, Montana). Normal (i.e. non-project) road maintenance would suffice to prepare these roads for haul. Section 7 analysis of potential effects of timber haul on ESA-listed species in Montana are the responsibility of the Lolo National Forest.
- Decommission from the Forests roads system a 1.6 mile segment of road #580 that stems into the Hoodoo Roadless Area at Gorman Hill by removing all unstable drainage structures and abandoning in place. An earthen barrier, or some other means of restricting motorized traffic, will be placed at the beginning of the decommissioned segment.

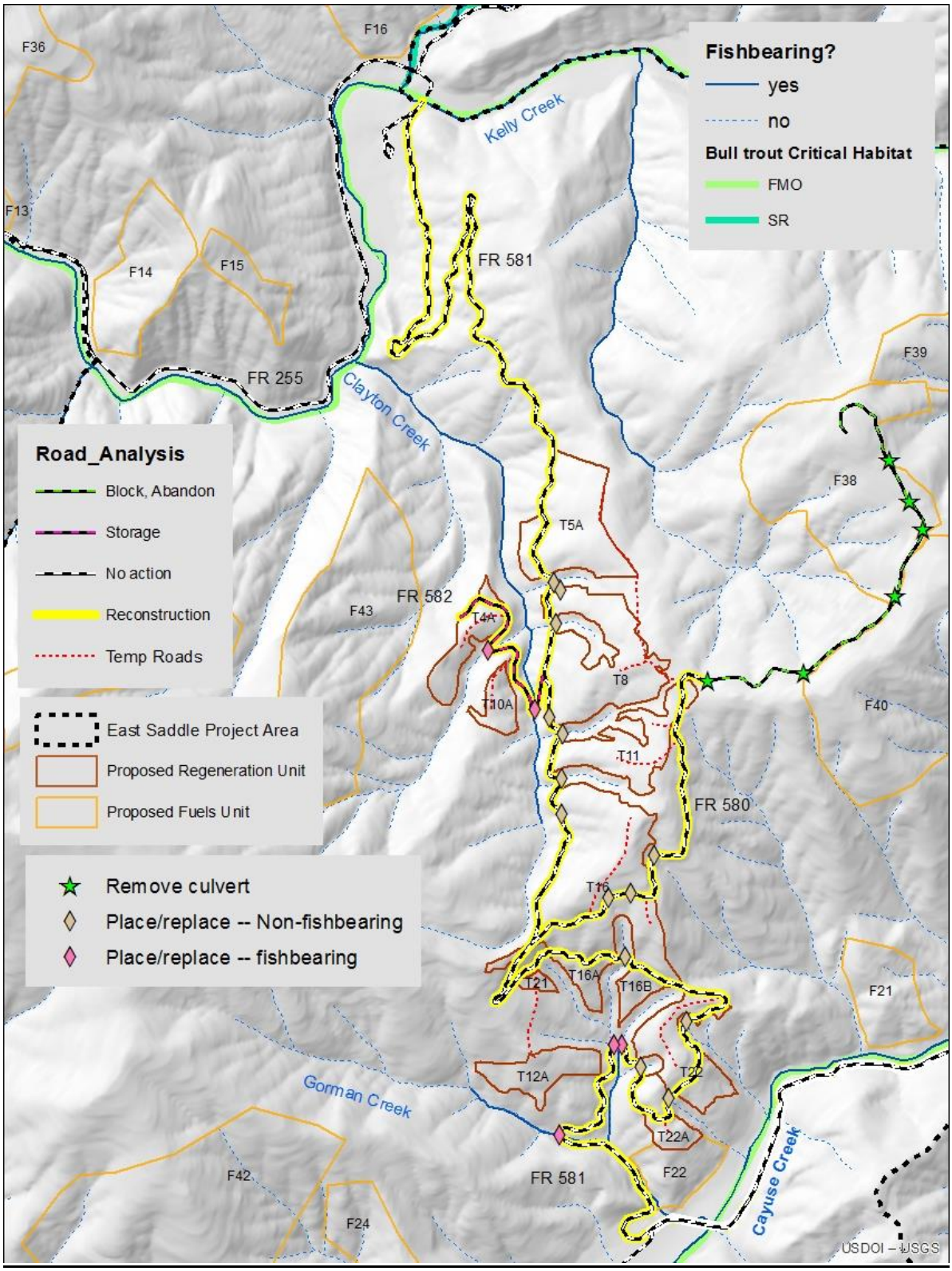


Figure 3. Regeneration harvest and roadwork detail of project area. About 14 acres of previously proposed regeneration harvest on the southern ends of units T22 and T22A are now proposed for fuels treatment/wildlife, but this map has not been modified to display this change.

Vegetation Management Activity Descriptions

Regeneration Harvest: This harvest method would remove most of the existing mature stand, producing a site with high sun exposure that would provide optimum growing conditions for the new stand. Restocking of the harvest unit would occur through the planting of western white pine, western larch, and ponderosa pine, with some natural regeneration of Douglas-fir, grand fir, mountain hemlock, and lodgepole pine. Varying numbers of trees would be retained for future snag recruitment, wildlife habitat, and soil productivity. This would ensure that snag levels would meet Northern Region Snag Management protocol.

For the purpose of maintaining snag habitat, timber harvest prescriptions would follow Regional guidance (Bollenbacher et al. 2009) on project level snag and live tree retention estimates in early seral conditions. The ranges of snags that remain within the entire project area should be the average density across the entire project treatment area and not to every treated acre within a project area. This means that not every acre requires retention of snags and live trees. At the harvest unit level, some acres may have no retention while others have a ¼ acre clump.

Full default riparian habitat conservation area (RHCA) no-cut buffers (not fully reflected in harvest unit boundaries in Figures 2 and 3) would be applied for regeneration harvest units (Aquatics Project Design Feature #1 and Soils Project Design Feature #4). These buffers would extend 300 feet on both sides of fish-bearing streams, 150 feet on both sides of perennial non-fish bearing water, 100 feet (the project area is within Priority Watersheds) on both sides of intermittent streams and around landslide-prone areas, and 150-foot slope distance from the edge of wetlands larger than one acre. Tractor and skyline yarding would be restricted during periods of wet soil to reduce erosion and soil compaction (Soils Project Design Feature #3).

Burning following Regeneration Harvest: This would consist of broadcast burning, underburning, jackpot burning, or mechanical or hand piling followed by pile burning. This treatment uses the silvicultural treatment of regeneration harvest to restore early-seral, fire-resilient species to the site. The vertical fuel profile is primarily removed with the harvest. Surface fuels are treated as described below to reduce the horizontal fuel profile to acceptable limits. Post-harvest fuels in regeneration units are expected to be 50-80 tons per acre. Prior to burning, some slashing of residual non-merchantable component may occur to ensure a more continuous fuel bed. The burning and/or mechanical treatments would reduce fuel loading to approximately 7-33 tons per acre, depending on the coarse woody debris guidelines for the site (see Section IV, Soils Project Design Feature #7 for more discussion). Wetter sites would have retention on the upper end of the spectrum, while drier sites would retain less fuel. Activity slash would be retained on the site over the winter before slash treatment occurs as required to mitigate soil resource concerns. Some mortality in leave trees is expected, especially if they are less fire-resilient species. This mortality is acceptable for snag recruitment. Hand surface fuel reduction would be done at the base of some leave trees to protect them better from potential high fire intensity during burning operations. Units with moderate slopes of less than 35% would likely be machine piled to reduce fuels and achieve adequate site preparation. Units with steeper slopes would be broadcast or underburned to achieve objectives. Units with a mix of slopes may have a mix of piling and burning in order to maximize the effective burn window and ensure units are treated and reforested in a timely manner. Prescribed fire burning windows are unpredictable, and smoke emission concerns can further limit that window. This mix of treatment methods for post-regeneration harvest fuel provides managers with alternatives to accommodate burn windows and achieve objectives.

Fuel treatment/elk habitat enhancement. The North Fork Ranger District proposes to treat about 3,400 acres of vegetation in 30 units to modify vegetation structure, reduce the potential for catastrophic fire, and/or to improve elk habitat. Specific "prescription" objectives for each unit would be developed, with the treatments planned, timed, and implemented to achieve these objectives. Implementation of these activities would be over a 3 to 7 year period, starting no earlier than 2020.

Commercial Vegetation Treatments (Regeneration Harvest)				
Unit #	**Treatment Type**	**Habitat**	**Logging System**	**Acres**
T4A	Clearcut w/Reserves	Summer Range	Ground Based/Skyline	22.7
T5A	Clearcut w/Reserves	Summer Range	Ground Based/Skyline	57.7
T8	Clearcut w/Reserves	Summer Range	Ground Based/Skyline	67.9
T10A	Clearcut w/Reserves	Summer Range	Ground Based/Skyline	12.0
T11	Clearcut w/Reserves	Summer Range	Ground Based/Skyline	38.1
T12A	Seedtree w/Reserves	Summer Range	Ground Based/Skyline	24.1
T16	Clearcut w/Reserves	Summer Range	Ground Based/Skyline	113.5
T16A	Shelterwood w/Reserves	Summer Range	Ground Based/Skyline	10.7
T16B	Shelterwood w/Reserves	Summer Range	Ground Based/Skyline	9.1
T21	Clearcut w/Reserves	Summer Range	Skyline	3.2
T22	Seed Tree w/Reserves	Summer Range	Ground Based/Skyline	29.6
T22A	Clearcut w/Reserves	Summer Range	Ground Based/Skyline	12.7
			Total	**401.3**

Non-Commercial Vegetation Treatments (Prescribed Fire and Mechanical Treatments)				
Unit #	**Treatment Type ***	**Habitat**	**Aspen**	**Acres**
F1	Spring Burn	Winter Range	No	11.3
F2	Spring Burn	Winter Range	Yes <2 acres	133.9
F4	Spring Burn	Winter Range	No	75.0
F5	Spring Burn	Winter Range	No	26.6
F6	Spring Burn	Winter Range	Yes <5 acres	193.7
F9	Spring Burn	Winter Range	Yes <3 acres	51.0
F12	Spring Burn	Winter Range	No	66.3
F13	Spring Burn	Winter Range	No	158.9
F14	Spring Burn	Winter Range	Yes minor	66.2
F15	Spring Burn	Winter Range	No	23.1
F16	Spring Burn	Winter Range	Yes <2 acres	198.7
F17	Spring Burn	Winter Range	No	73.1
F18	Spring Burn	Winter Range	No	45.1
F19	Spring Burn	Winter Range	No	67.5
F21	Spring Burn	Winter Range	No	43.5
F22	Spring Burn	Winter Range	No	30.5
F22B	Spring Burn	Winter Range	No	9.7
F24	Spring Burn	Winter Range	No	88.7
F25	Spring Burn	Winter Range	No	125.4
F28	Summer/Fall Burn	Summer Range	Yes <5 acres	167.1
F29	Summer/Fall Burn	Summer Range	No	133.8
F30	Summer/Fall Burn	Summer Range	No	96.2
F31	Summer/Fall Burn	Summer Range	No	133.8
F34	Summer/Fall Burn	Summer Range	No	163.3
F36	Summer/Fall Burn	Calving Area	Yes <70 acres, patchy	252.9
F38	Summer/Fall Burn	Calving Area	Yes	168.6
F39	Summer/Fall Burn	Calving Area	Yes <14 acres	105.4
F40	Summer/Fall Burn	Calving Area	Yes <13 acres	237.2
F40A	Summer/Fall Burn	Calving Area	No	39.9
F42	Summer/Fall Burn	Calving Area	Yes	255.8
F43	Summer/Fall Burn	Summer Range	No	191.4
			Total	**3434.5**

Tables 3 and 4. Proposed timber harvest and fuels/elk habitat units.

The primary method of treatment would be broadcast burning, with the potential for hand-cutting ("slashing") of some shrubs and small trees. All units would be broadcast-burned; in about half of the units, the burns would be preceded by vegetation slashing in portions of those units to facilitate subsequent burns. Broadcast burns would be ignited by hand or aerially from a helicopter equipped with a plastic sphere dispenser. These burns would typically be ignited in strips starting at the top of units, allowing fire to progress relatively slowly downslope; additional ignitions may be made if the burn progress dwindles or stops. The burn of a unit would typically be completed within a few days, but may smolder for additional days or weeks.

Slashing would consist of hand-cutting of shrubs >2' in height and trees <6" dbh in swaths of about 30' in width to promote ignition and burning in portions of units within which it may otherwise be difficult to achieve prescription objectives. The vegetation slashed would not be piled, but larger trees may be bucked or limbed in order to enhance burning or to minimize effects to mature trees and other resources. Slashing may include up to about 25% of the area of each unit where this activity is performed, and would be implemented from a few months to about a year prior to the burn on any particular unit. In units where aspen is present, chainsaws may be used to cut and fell the mature aspen and/or competing conifers within or adjacent to the clone to promote regeneration of the aspen.

Hand ignition or slashing would not require construction of new roads or trails, or reconstruction or targeted maintenance of existing roads or trails. Hand ignition would be accomplished by Forests fire staff with drip torches, fuses, and/or hand-thrown devices, while hand slashing would also be performed by Forests fire staff using chainsaws or hand tools.

Broadcast burn units in the East Saddle Project typically include steep hillsides which include or are bounded by small (typically intermittent or ephemeral) stream channels which drain these slopes; some of the units approach larger stream channels at their lower boundaries. Prescribed fire would not be ignited within RHCAs of any of these streams and no slashing, piling, or aspen treatments would occur within RHCAs. The District does not propose to construct firelines or to take active measures to otherwise deliberately exclude broadcast burns from RHCAs, but will allow prescribed fire to enter these areas (particularly the small channels which dissect or laterally bound the units) at least as long as the burns are otherwise progressing as planned (i.e., within prescription). On the other hand, areas within units which are relatively closely bounded by RHCAs may not be ignited. In particular, ignition of burns above the RHCAs of fish-bearing streams would be well upslope of RHCAs, typically by several hundred feet, during periods when core RHCAs would be relatively moist and unlikely to burn. It is therefore very unlikely that the proposed burns would closely approach fishbearing stream channels or areas of riparian vegetation bordering these streams (e.g. willows or alders). Broadcast burns extending slightly beyond planned unit boundaries or into RHCAS would typically not be suppressed unless the deviation from prescription threatens structures or areas deemed necessary for protection, or is necessary to halt or preclude wildfire.

In the project area of the District, prescription burns are typically implemented during two periods: spring and fall. These periods do not necessarily correspond to a strict seasonal calendar, but to weather, vegetation, and soil conditions that allow the burns to be conducted in a manner that would achieve prescription objectives but which are controllable and safe for burn personnel and which avoid adverse resource effects. Broadcast burn units in close proximity and burns within individual units would often be staggered over several burn seasons or years to allow for a mix of vegetation response and to reduce the potential for concentrated effects to other resource variables.

Road Construction, Reconstruction, Other Road Improvements, and Haul Routes:
As shown in Table 2, the Forests proposes to construct up to about 2.8 miles of temporary road, but no new permanent road. As described in more detail in Project Design Features #5 and #6, below, none of the temporary roads would cross stream channels or easily-erodible soils, and would typically be obliterated within 3 years of construction. As also shown in Table 2, up to 11.1 miles of existing system road would be reconstructed for the

project, with about 0.8 miles of this reconstructed road being placed into long-term storage (described below). The road proposed for reconstruction currently has a native surface, but to reduce the potential for fine sediment introduction to stream channels during use and maintenance of reconstructed road, gravel will be placed at all stream crossings (See Hydrology project design feature #4).

Some project roads (580, 581, 582, and possibly 255) and roads leading off the Forests (possibly the 250 and 255 roads) would be used by trucks to transport logs to mills. It is possible that timber from the project would be hauled over Hoodoo Pass into Montana on roads managed by the Lolo National Forest. The timber purchaser would need to obtain a road use permit from the Lolo NF for this activity, so this analysis does not address any activities off of the NP-CNF. Road work, including drainage improvements, would be performed during dry periods to avoid causing erosion and soil compaction (Aquatic Project Design Feature #4 and Soils Project Design Feature #3).

Regular road maintenance, as well as road-related activities which would facilitate timber harvest and haul or improve hydrologic function and reduce sediment transmission to streams, are proposed under the East Saddle project. The 580, 581, and 582 project area roads that access timber harvest units are overgrown, have suffered erosion, or are otherwise not ready for use by logging equipment or trucks and so would be reconstructed (Figure 3). In reconstruction, an existing road prism is cleared of vegetation, shaped to a drivable surface, and drainage features/structures are installed, cleaned, reset, or replaced. Ditch maintenance would be designed to minimize soil and vegetation disturbance by only removing vegetation or debris where it is impeding water flow. Gravel placement and catchment improvements would minimize erosion from existing road conditions. Although the reconstruction activities are designed to reduce sediment input over the long-term, there is the potential for a minor increase in sediment production in the short-term, particularly during culvert replacements.

Road maintenance, sometimes referred to as road reconditioning, would include activities intended to improve road surface catchment and decrease the potential for sediment delivery from roads and would involve less road prism disturbance than road reconstruction. Activities would include cleaning ditches and cross-drain culverts and blading of road surfaces to re-establish drainage. The project portion of the 255 road and gravel portions of roads used for log haul outside the project area (the 250 and/or 255 road) may receive maintenance during the project haul period, but these activities are routinely performed by the District because both the 250 and 255 roads are primary Forest routes in relatively heavy use by Forests staff and visitors. As such, road maintenance on the 250 or 255 roads is not analyzed in this document.

All roads used for harvest activities and haul would be maintained to minimize erosion and provide proper catchment through surface blading, installation of catchment dips, and ditch and culvert maintenance. Haul on roads would not occur during wet conditions to prevent rutting and concentrated water flow on roads. This would minimize erosion from the road surface and the risk of sediment delivery to streams. At the end of the operating season, surface grading and maintenance of existing catchment structures on reconstructed roads would occur to control erosion during the precipitation and runoff seasons. Additional temporary waterbars or catchment dips may be needed to effectively control erosion during the non-use season. These requirements are included in BMPs applied on this project and are expected to minimize road erosion and prevent sediment delivery to streams. On the Forest, BMPS applied to prevent sediment delivery from roads used and maintained for timber harvest activities have high implementation and effectiveness rates, averaging 99% and 98% respectively, from 1990-2009 (USDA-FS 1990-2009).

Watershed Improvement

- Decommission (in the form of barrier construction, abandonment, and culvert removal) the distal 1.6 miles of system road 580. Remove up to 6 culverts on non-fishbearing streams using heavy equipment or hand tools on this segment of road.

- Place into long term storage 0.8 miles (essentially the entire length) of the system road 582. Storage would be performed after reconstruction, timber harvest, and activity fuels treatment, ideally within a single season. A new culvert would be installed at the Clayton Creek crossing, and, while the current crossing of the unnamed tributary of Clayton Creek by the 582 road has a culvert, this structure is damaged and may need to be replaced as part of the reconstruction.
- As a part of reconstruction on the 581 and 582 roads, replace up to 5 culverts on fishbearing streams and up to 13 culverts on non-fishbearing streams. Also, replace or reset about 25 culverts on the 581 road which pass small amounts of perennial water but should be considered seeps rather than streams.

Watershed Improvement Activity Descriptions: Part of the purpose of the East Saddle project is to improve watershed conditions, primarily through road decommissioning and storage (and removal of associated culverts). Several culverts on road segments which would be maintained and which are undersized for their catchments or are otherwise deficient would be replaced with new and (usually) larger pipes.

*Road Decommissioning and Long Term Storage***:** The distal end of the 580 road has been identified as no longer needed for management (see Figure 3 and Table 2) and would be decommissioned through abandonment to: (1) more closely align the area with its management category, (2) decrease soil erosion and instream sediment deposition, and (3) restore hillslope hydrologic processes to a more natural condition. This road segment is at or near the ridgetop with only minor stream crossings, so there is minimal risk of soil erosion or mass failure. Abandonment would leave the road in place and allow vegetation to reclaim the road surface. All culverts would be removed and a barrier to motorized vehicles placed at the proximal end of the road at the 581 road junction.

Following timber harvest, site preparation, and planting, FR 582 is projected not to be used for the next 20 years or longer and so would be put into long-term stored service (i.e., storage). Practices used are intended to assure that the road is placed into a self-maintaining condition that removes all high risks of failure. Although the 582 road is to be retained on the transportation system and closed to full-size motorized vehicles, it may or may not be closed to motorcycles and ATVs, depending on future analyses.

Road decommissioning and placing roads into long term storage are proposed to correct existing resource problems and not to mitigate for other elements of this project. It is possible that a few non-system road segments within the project area are not accounted for at this time, but may be discovered during layout or implementation of the project. The Forests proposes to decommission, put into long-term storage, or allow continued passive restoration of these roads, as appropriate, in a manner consistent with the roads already identified in this BA.

Culvert removal. Existing road crossings of streams in the project area are made with culverts. In the proposed project, the culverts on the 580 road segment to be decommissioned and the 582 road segment to be stored would be removed. The one crossing of a verified fishbearing stream on a road proposed for decommissioning or storage (based on GIS layers) would be at the 582 crossing of Clayton Creek and is listed in Table 5 and shown in Figure 3. The 2nd stream crossing of the 582 road is at the crossing of an unnamed tributary (UT) of Clayton Creek. A brief survey at the UT site did not reveal the presence of fish, but this stream is large enough to support a few westslope cutthroat trout.

In addition, based on the GIS layers, there are up to about 6 crossings/culvert sites on non-fishbearing streams with proposed system or non-system road decommissioning or storage. There are all on the segment of FR 580 which would be decommissioned primarily through abandonment, and presumably pass the flow from very small drainages/seeps and that drain ditches. There are no stream crossing culverts necessary for proposed temporary road; any ditch relief culverts would be pulled upon obliteration of these roads.

Road decommissioning and storage would typically be performed with heavy equipment, typically trackhoes (aka excavators) working from the road prism (i.e., trackhoe movement would not disturb soil and vegetation off of the road to be decommissioned; this would be the storage method used for the 582 road. Removal of any culverts on the section of the 580 road to be decommissioned in place would potentially be by hand to avoid disturbing vegetation on the road prism, but heavy equipment may be used if it is determined that the culverts are too deep or otherwise unsuitable for hand tools.

Road decommissioning and storage would be performed during dry periods to avoid causing erosion and soil compaction (Project Design Feature #4) and culvert removal associated with decommissioning and storage would be performed during periods of low streamflow (typically late summer and early fall). The Forests would take other measures when decommissioning roads (Aquatics Project Design Feature #6) and removing culverts (Aquatics Project Design Feature #7) to minimize transmission of sediment into stream channels.

Culvert placement/replacement: Some of the culverts passing streams under existing roads which are to be retained after project implementation (as opposed to culverts on roads which are to be stored or decommissioned) are undersized for the potential flow volume of the relevant stream width or drainage area, have been damaged, or were constructed with or have formed impediments to upstream aquatic animal passage. It is also possible that there are sites where the placement of a small culvert on a road to be reconstructed would avoid existing and undesirable drainage from a seep or tiny stream onto the road surface.

Part of the project proposal is to place or replace up to about 18 of these culverts with new structures. Of the up to 18 culverts proposed for replacement, 5 are on fish-bearing or potentially fish-bearing perennial streams (see Figure 3 and Table 5 for locations); and the remainder are on small-to-tiny non-fishbearing perennial streams, seeps, or trickles (Figure 3). Culvert replacements would be performed during periods of low streamflow (typically late summer and early fall) and other measures (Aquatics Project Design Feature #7) would be taken to minimize transmission of sediment into stream channels.

Table 5. Road and watershed activities with instream work on fish-bearing streams

Road	Stream	Activity
582	Clayton Creek	Reconstruct road, replace culvert with larger pipe
582	Unnamed Trib of Clayton Creek	Reconstruct road, replace culvert with larger pipe
581	Gorman Creek	Reconstruct road, replace culvert with larger pipe
581	Unnamed Trib of Gorman Creek	Reconstruct road, replace culvert with larger pipe
581	Unnamed Trib of Gorman Creek	Reconstruct road, replace culvert with larger pipe

IV. DESIGN FEATURES AND MITIGATION MEASURES

Project Design Features are aimed at avoiding specific resource issues. A majority of these are derived from site-specific best management practices (BMPs) from the Idaho Forest Practices Act and Stream Channel Alteration Handbook, with comparable practices from the FS R1/R4 Soil and Water Conservation Practices Handbook (FSH 2509.22). Relevant measures are listed below, and the effectiveness of the each measure is also included, where applicable.

Water Quality and Fish Habitat

WQ-1. Avoid direct ignition of fuels within RHCAs. Where low-intensity fire is allowed to back into the edges of some of these areas, the result should be no more than 10% tree mortality.

Anticipated Effectiveness: *Low-intensity prescribed fire and underburning has resulted in incidental mortality of leave-trees, yet mortality is minimal and often limited to edges or isolated trees.*

WQ-2. INFISH Riparian Management Objectives, standards, and guidelines would be applied to protect aquatic resources, to include Riparian Habitat Conservation Areas (RHCA) default buffers. INFISH default buffers are to be used to define timber sale unit boundaries where water features are present. No timber harvest is to occur within 300 feet of fish-bearing streams, 150 feet of perennial non-fish bearing water, 100 feet of intermittent streams (in Priority Watersheds, which includes all areas within the project area), 150-foot slope distance from the edge of wetlands larger than one acre.

Anticipated Effectiveness: *Clearwater National Forest audits show this measure to be 99% effective.*

WQ-3. Per INFISH direction, all field-verified unstable and landslide-prone areas will receive a 100-foot (in Priority Watersheds, which includes all areas within the project area) slope no-harvest, no-ignition buffer from perimeter of areas that contain unstable soils.

Anticipated Effectiveness: *Protecting RHCA's and avoiding removal of trees in verified landslide prone areas will be highly effective at limiting management caused sedimentation (either through surface erosion or mass wasting) from stream channels. Forest soil scientists have observed that adjusting canopy retention based on landscape features has been effective in maintaining slope stability. Avoidance of wet and unstable soils provides effective soil and water protection.*

WQ-4. Temporary roads would be located on upper hillslope or ridgetop positions (where feasible) and would not cross highly sensitive or unstable areas, such as perennial or intermittent streams, wetlands, areas with wet or poorly-drained soils, or unstable steep concavities and dissections that accumulate water to minimize the potential for surface erosion, road failures, and sediment delivery.

Anticipated Effectiveness: *High, based on literature, San Dimas, Road/Water Interaction. Road design and mitigation can decrease sediment production with use of slash windrows, application of gravel and application of seed to disturbed areas. Design of cut and fill slopes at gentler grades decrease likelihood of surface erosion. Increasing frequency of drainage structures minimizes the contributing area of surface erosion and sediment introduction to streams.*

WQ-5. During road decommissioning or long-term storage activities, measures are to be taken to prevent sediment from entering streams during project activities and in the long-term, such as: (a) placing removable sediment traps below work areas to trap fines; (b) when working instream, removing all fill around pipes prior to bypass and pipe removal (where this is not possible, use non-eroding diversion); (c) revegetating scarified and disturbed soils with grasses (weed free) for short-term erosion protection and with shrubs and trees for long-term soil stability; (d) mulching with native materials, where available, or using weed-free straw to ensure coverage of exposed soils; (e) dissipating energy in the newly constructed stream channels using log or rock weirs; and (f) armoring channel banks and dissipating energy with large rock whenever possible.

Anticipated Effectiveness: *Monitoring has shown decommissioning and storage treatments to be effective at reducing surface erosion and mass failure risk while increasing water infiltration rates and vegetative ground cover (Foltz 2007, USDA 1999-2009).*

WQ-6. Proposed culvert replacements on the 581 road would be sized to pass a 100 year flow event, but the temporary culvert (or culverts) placed at the 582 road crossing (of Clayton Creek and its unnamed tributary) would not be required to meet this standard. Crossing replacements would follow natural stream grade to accommodate sediment, debris and water transport. BMPs and Project Design Features similar to those listed

above (Project Design Feature #5) for road decommissioning and storage activities would be employed to minimize sediment inputs to streams.

Anticipated Effectiveness: *High, based on experience and literature, San Dimas, Road/Water Interaction*

WQ-7. The Purchaser/Contractor shall take all reasonable precautions to prevent possibility of fuel spills Criteria within the "B" provision of the timber sale contract will be followed.

Anticipated Effectiveness: *Moderate effectiveness. Requiring Contractors to maintain equipment and ensure containment of any fluids used during standard equipment service and/or containment in the advent of accidental spills is a highly effective method for protecting soil and water from pollutants. Planning ensures foresight, but cannot eliminate the risk of materials being spilled and escaping into waters.*

WQ-9. All reconstructed and temporary road segments within INFISH RHCAs would be graveled 100 feet on either side of the crossing upon completion of reconstruction/construction

Anticipated Effectiveness: *High, based on experience and literature (Brown et al., 2013, Clinton and Vose 2003, Burroughs 1990, Kochenderfer and Helvey 1987, Swift 1984,)*

Soil Resources

SR-1. Directionally fell trees to facilitate efficient removal along pre-designated yarding patterns with the least number of passes and the least amount of disturbed area.

Locate and design skid trails, landings and yarding corridors prior to harvest activities to minimize the area of detrimental soil effects. Re-use existing skid trails and roads as much as possible. Space tractor skid trails a minimum of 80 feet apart, except where converging on landings, and reuse existing skid trails where practicable, to reduce the area of detrimental soil disturbance. This does not preclude the use of feller bunchers if soil impacts can remain within standards. If forwarder operations are used, a slash mat at least 4" thick would be placed on skid trails.

Anticipated Effectiveness: *Reducing off-road equipment usage is an effective way to reduce the effects of harvesting trees to soil resources. Minimizing the off-road use of equipment will reduce soil displacement, compaction, and erosion. Reusing existing skid trails, reducing the number of passes on skid trails, and limiting the area covered by skid trails will reduce erosion and compaction in areas of tree removal (Froelich et al 1985; Haupt and Kidd 1965).*

SR-2. Limit ground-based skidding slopes of 35% or less. In areas with slopes exceeding 35%, cable/skyline systems would be used.

Anticipated Effectiveness: *Changing logging method from tractor to cable system reduces soil disturbance by 8-20%, logging systems that switch from tractor to skyline reduce disturbance by 20% (Archer 2008).*

SR-3. Restrict activities when soils are wet to prevent resource damage (indicators include excessive rutting, soil displacement, and erosion).

Anticipated Effectiveness: *Saturated soils are more susceptible to compaction than drier soils (Alexander and Poff 1985; Adams and Froehlich 1981; Moehring and Rawls 1970). An early research study suggests that on saturated soils one pass with harvest equipment is machine is equal to four passes when soils are dry*

(Steinbrenner 1955). Limiting operating periods on saturated soils will reduce the impact of tree removal to both watershed and soil resources.

SR-4. Retain 7-33 tons per acre of coarse woody debris greater than or equal to 3 inches in diameter following completion of activities. Drier Sites would retain 7-12 tons per acre and moister sites would retain 12-33 tons per acre of coarse woody debris (Graham et al. 1999).

Anticipated Effectiveness: *Retaining coarse woody debris will be effective for ensuring long-term soil productivity (Graham et al 1994; Graham et al 1999). Coarse wood debris will also significantly reduce surface erosion as described in low to moderate intensity rainfalls (Robichaud et al 2008).*

SR-5. Scarify and recontour excavated skid trails to restore slope hydrology and soil productivity.

Anticipated Effectiveness: *Recontouring or scarifying skid trails on unburned soils is effective for increasing infiltration capacity and reducing runoff (Foltz et. al 2007) and covering rehabilitated trails with at least 50% slash cover will reduce potential surface erosion from trails by up to 90% (Wade et al 2012, Foltz et al 2009).*

SR-6. All skid trails susceptible to erosion would be scarified or re-contoured (decommissioned) in the same season following harvest, if logistically possible, or have other appropriate erosion control measures applied. Scarify non-excavated skid trails and landings that are compacted or entrenched 3 inches or more. Scarify to a depth of 6 to 14 inches. Appropriate decommissioning or application of necessary erosion control measures for all skid trails would typically be performed within 3 years of construction.

SR-7. All temporary roads will be scarified and recontoured (decommissioned). Reshape cut/fill slopes and crossings to natural contours. Apply available slash to the recontoured surface (slash is considered available where the equipment is able to reach it from the working area where the decommissioning is occurring). Typically within 3 years of construction.

Anticipated Effectiveness: *Obliterating temporary roads as soon as possible will reduce potential and opportunity for sediment transport to streams. Overall amounts of sediment will be reduced.*

Wildlife

WL-1. Monitor bald eagle historic nest area prior to implementation of fuels units F25 and F31/

WL-2. Rocky mountain elk thermal cover maintenance requirements limiting dimensions of slashing or hand-cutting in 39 acres of fuels treatment units (F2 and F22) to maintain hiding cover in thermal cover areas in units.

WL-3. Ignition would be avoided or prescription written such that it would retain existing old growth forest habitat conditions in fuel treatment unit F34 (76 ac).

WL-4. Marten (fisher) denning, resting, and subnivean zone access protections through maximizing the size of coarse woody debris retention across the 45 acres of regeneration harvest units T8, T5A, and T16.

WL-5. Prescribed fuels treatments to benefit Rocky mountain elk calving areas would be implemented outside of the elk sensitivity period for that area.

WL-6. Cedar tree retention specification to optimize Fisher denning or resting options along edges adjacent to areas that are riparian, cedar dominated, or old growth. (Unit T12A adjacent to riparian area)

Silviculture

SC-1. For the purpose of maintaining snag habitat, timber harvest prescriptions would follow Regional guidance (Bollenbacher et al. 2009) on project level snag and live tree retention estimates in early seral conditions.

> ***Anticipated Effectiveness:*** *Snags and live trees selected for retention are typically designated by leave tree marking, giving a high degree of control of meeting these guidelines during harvest. Some unexpected removals of snags designated for retention does occur during implementation for safety of logging and fire personnel, but retention of live trees will ensure adequate snag recruitment. Post-harvest monitoring also determines if snag and live tree retention met the prescription.*

SC-2. For the temporary road accessing unit T12A, wildlife or silviculture staff will be consulted in design and layout location in order to minimize impact to the adjacent old growth stand.

Botany

BT-1. Protect TES plant species and/or potential habitat identified at any point during planning or implementation as recommended by the unit botanist and approved by the appropriate line officer. (Timber Sale Contract Provision, currently B6.24).

Noxious Weeds

NW-3. Remove all mud, soil, and plant parts from off road equipment before moving into the project area to limit the spread of noxious weeds, and otherwise conform to standard Forest Service contract provision C6.351:

- Conduct cleaning off National Forest lands.

> ***Anticipated Effectiveness:*** *Moderate effectiveness. Requiring Contractors to clean equipment is a fairly highly effective method for reducing transfer of weed seeds; planning ensures foresight, but cannot eliminate the risk of hard-to-clean equipment retention of seeds. Spraying can often be effective in eliminating initial infestation of weeds.*

V. EXISTING CONDITION

General and Aquatics

The primary human activities in the project area that would have the potential to affect special-status species have been transportation/road construction, timber harvest and associated activities, and recreational activities.

The project area is composed completely of National Forest System (NFS) lands. By stream catchment areas, the project area includes about 11,694 acres (~82%) of the Lower Cayuse subwatershed of the Cayuse Creek watershed, about 11,756 acres (~37%) of the Lower Kelly subwatershed of the Kelly Creek watershed, about 1,755 acres (~5%) of the Elizabeth Creek-North Fork subwatershed of the Lake Creek-North Fork watershed, and about 123 acres (<1%) of the Deadwood-Moose subwatershed of the Moose Creek watershed (Figure 16).

Regeneration harvest and all road-related activities (except for some timber haul) would be limited to portions of the Lower Cayuse and Lower Kelly subwatersheds, while prescribed fire treatments are proposed in all four project subwatersheds. Timber haul corridors would extend outside of the project area on Forest Roads 255 and/or 250, which all have gravel or paved surfaces. Although unlikely, effects on aquatic resources could be manifested in streams in these haul corridors, particularly for bull trout because of the critical nature of the North

Fork Clearwater River as migratory and adult/subadult rearing habitat for this species. Because substantial portions of both the Lower Cayuse and Lower Kelly subwatersheds are within the project areas, cumulative effects should be considered at the full subwatershed scale for these drainages, but vegetation management activities in the Elizabeth Creek-North Fork and Deadwood-Moose subwatersheds should be too minor to affect aquatic resources at the full subwatershed scale.

The project area (Figure 1) is relatively remote from populated areas, but is popular with anglers and other recreationists and receives substantial visitor use. The District's Kelly Creek Work Center is just west of the project area, near the western junction of the heavily-travelled 250 and 255 roads (Figure 2). The 250 road parallels the North Fork Clearwater River above its confluence with Kelly Creek for about 4 miles and is the northwestern boundary of the project area, while the 255 road parallels Kelly Creek (where it is the southern project boundary) for about 11 miles and provides access to the regeneration harvest units along the 581 road. The 581 road itself is not normally heavily traveled, but provides access to the Cayuse Creek airstrip and other features of the upper Cayuse Creek drainage. The remainder of project area system roads are old timber or recreation access spurs. The full haul route for project timber is currently unknown, but access to miles would either be (to the west) along the 250 road to near Pierce, Idaho or (to the northeast) along the 255 road over Deception Saddle to the upper 250 road and then over Hoodoo Pass to Montana.

The project area is about 30 air miles northeast of Pierce, Idaho and 33 air miles southwest of Superior, Montana. As noted above, the area is relatively popular with recreationists despite it remote location. Kelly Creek (especially that section paralleled by the 255 road, Figure 18) is considered to be a blue ribbon westslope cutthroat trout fishery, as are (to a somewhat lesser extent) the upper North Fork in Black Canyon and Cayuse Creek. The FR 250 and 255 corridors within the East Saddle project area is primarily used by anglers, campers (both dispersed and at the Kelly Forks developed campground), ATVers and motorcyclists in the summer, hunters in the autumn, and snowmobilers in the winter. Focal points for recreationists in and near the project area are the Kelly Creek trailhead/bridge area, the Cayuse Airstrip (both of which also support outfitter camps) and the Scurvy Mountain Lookout (which is accessed by an ATV trail). Motorized trails within the project area include the Scurvy Mountain Trail 524 and a portion of the Cayuse Creek Trail 532, and several segments of non-motorized trails (primarily the 532 and 534) are also within the project area.

Regeneration harvest and all road-related activities (except for some timber haul) would be limited to portions of the Lower Cayuse and Lower Kelly subwatersheds, while prescribed fire treatments are proposed in all four project subwatersheds. Timber haul corridors would extend outside of the project area on Forest Roads 255 or 250, which all have gravel or paved surfaces. Although unlikely, effects on aquatic resources could be manifested in streams in these haul corridors, particularly for bull trout because of the critical nature of the North Fork Clearwater River as migratory and adult/subadult rearing habitat for this species.

Because substantial portions of both the Lower Cayuse and Lower Kelly subwatersheds are within the project areas, cumulative effects should be considered at the full subwatershed scale for these drainages, but vegetation management activities in the Elizabeth Creek-North Fork and Deadwood-Moose subwatersheds should be too minor to affect aquatic resources at the full subwatershed scale.

Ongoing and foreseeable activities that might have the potential to affect aquatic species within the analysis area include primarily include timber harvest and associated road construction, road decommissioning and other rehabilitation, motorized recreational activities, and firewood gathering. Game species are subject to angling under State regulations.

Terrestrial Species

Canada Lynx

Management Direction

The Northern Rockies Lynx Management Direction (2007) contains a set of objectives, guidelines, and standards applicable to mapped lynx habitat on Forest lands that are presently occupied, with the overarching Goal to conserve the Canada lynx. This document demonstrates compliance with the following objectives, guidelines, and standards that are relevant to this project.

Objectives

- ALL O1: Maintain or restore lynx habitat connectivity in and between Lynx Analysis Units (LAUs), and in linkage areas.
- VEG O1: Manage vegetation to mimic or approximate natural succession and disturbance processes while maintaining habitat components necessary for the conservation of lynx.
- VEG O2: Provide a mosaic of habitat conditions through time that support dense horizontal cover, and high densities of snowshoe hare. Provide winter snowshoe hare habitat in both the stand initiation structural stage (SISS) and in mature, multi-story conifer vegetation.
- VEG O3: Conduct fire use activities to restore ecological processes and maintain or improve lynx habitat.
- VEG O4: Focus vegetation management in areas that have potential to improve winter snowshoe hare habitat but presently have poorly developed understories that lack dense horizontal cover.

Guidelines

- ALL G1: Methods to avoid or reduce effects on lynx should be used when constructing or reconstructing highways or forest highways across federal land. Methods could include fencing, underpasses, or overpasses.
- VEG G1: Vegetation management projects should be planned to recruit a high density of conifers, hardwoods, and shrubs where such habitat is scarce or not available. Priority for treatment should be given to stem-exclusion, closed-canopy structural stage stands to enhance habitat conditions for lynx or their prey (e.g. mesic, monotypic lodgepole stands). Winter snowshoe hare habitat should be near denning habitat.
- VEG G4: Prescribed fire activities should not create permanent travel routes that facilitate snow compaction. Constructing permanent firebreaks on ridges or saddles should be avoided.
- VEG G5: Habitat for alternate prey species, primarily red squirrel, should be provided in each LAU.
- VEG G11: Denning habitat should be distributed in each LAU in the form of pockets of large amounts of large woody debris, either down logs or root wads, or large piles of small wind thrown trees ("jack-strawed" piles). If denning habitat appears to be lacking in the LAU, then projects should be designed to retain some coarse woody debris, piles, or residual trees to provide denning habitat in the future.
- HU G6: Methods to avoid or reduce effects on lynx should be used in lynx habitat when upgrading unpaved roads to maintenance levels 4 or 5, if the result would be increased traffic speeds and volumes, or a foreseeable contribution to increases in human activity or development.
- HU G7: New permanent roads should not be built on ridge-tops and saddles, or in areas identified as important for lynx habitat connectivity. New permanent roads and trails should be situated away from forested stringers.
- HU G8: Cutting brush along low-speed, low-traffic-volume roads should be done to the minimum level necessary to provide for public safety.
- HU G9: On new roads built for projects, public motorized use should be restricted. Effective closures should be provided in road designs. When the project is over, these roads should be reclaimed or decommissioned, if not needed for other management objectives.

Standards

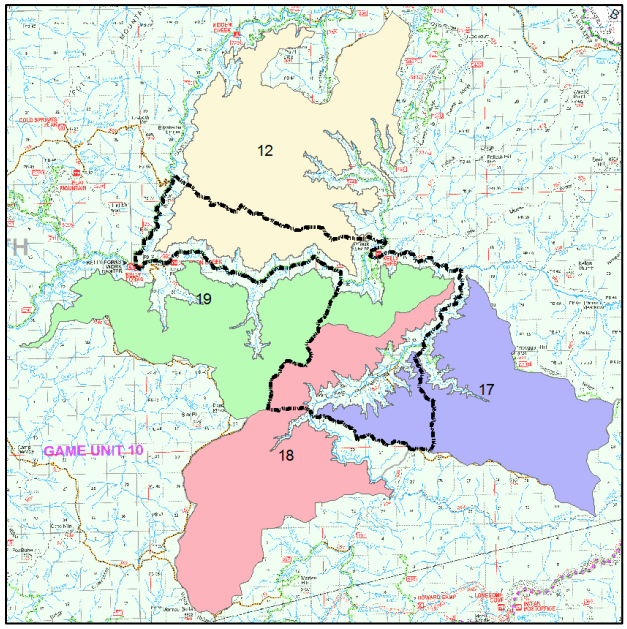
- ALL S1: New or expanded permanent development and vegetation management projects must maintain habitat connectivity in an LAU and/or linkage area.

- VEG S1: applies to all vegetation management projects that regenerate forests. Fuel treatment projects may not result in more than three adjacent LAUs exceeding the standard. Unless a broad scale assessment has been completed that substantiates different historic levels of SISS limit disturbance in each LAU as follows: If more than 30 percent of the lynx habitat in an LAU is currently in a SISS that does not yet provide winter snowshoe hare habitat, no additional habitat may be regenerated by vegetation management projects.
- VEG S2: applies to all timber management projects that regenerate forests. Timber management projects shall not regenerate more than 15 percent of lynx habitat on NFS lands within an LAU in a ten-year period.
- VEG S6: applies to all vegetation management projects. Vegetation management projects that reduce snowshoe hare habitat in multi-story mature or late successional forests may NOT occur. Timber harvest is allowed in areas that have potential to improve winter snowshoe hare habitat but presently have poorly developed understories that lack dense horizontal cover [e.g. uneven age management systems could be used to create openings where there is little understory so that new forage can grow]).

Analysis Area, Indicator, Measure, & Desired Condition

The Clearwater National Forest (Forest) is regarded as secondary occupied habitat. The Lynx analysis area for this project is composed of the four lynx analysis units (12, 17, 18, and 19) that intersect the project area (Figures 8 and 9) encompassing 87,193 acres. The indicator used to assess potential project effects to lynx is modeled habitat, and the measure is acreage of habitat. The desired condition for lynx is to have "a mosaic that includes dense early-successional coniferous and mixed-coniferous-deciduous stands, along with a component of mature multi-story coniferous stands to produce the desired snowshoe hare density within each LAU [and…] distributed across the LAU in a landscape pattern that is consistent with historical disturbance processes" (Interagency Lynx Biology Team 2013).

Figure 8. Lynx Analysis Area Relative to Project Boundary, and Figure 9 (below). Lynx Analysis Areas Relative to Proposed Action Units.



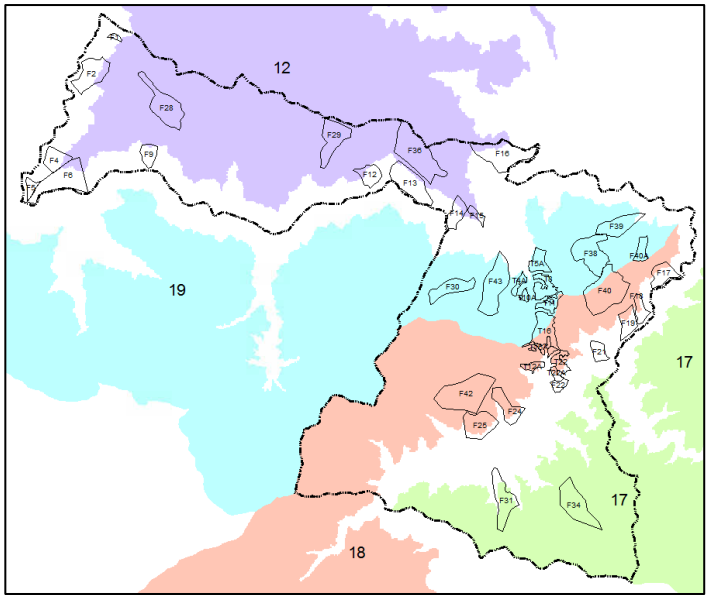


Figure 10. Observation Records within 30 miles of, and Figure 11. Lynx Observations in Vicinity of Project Area.

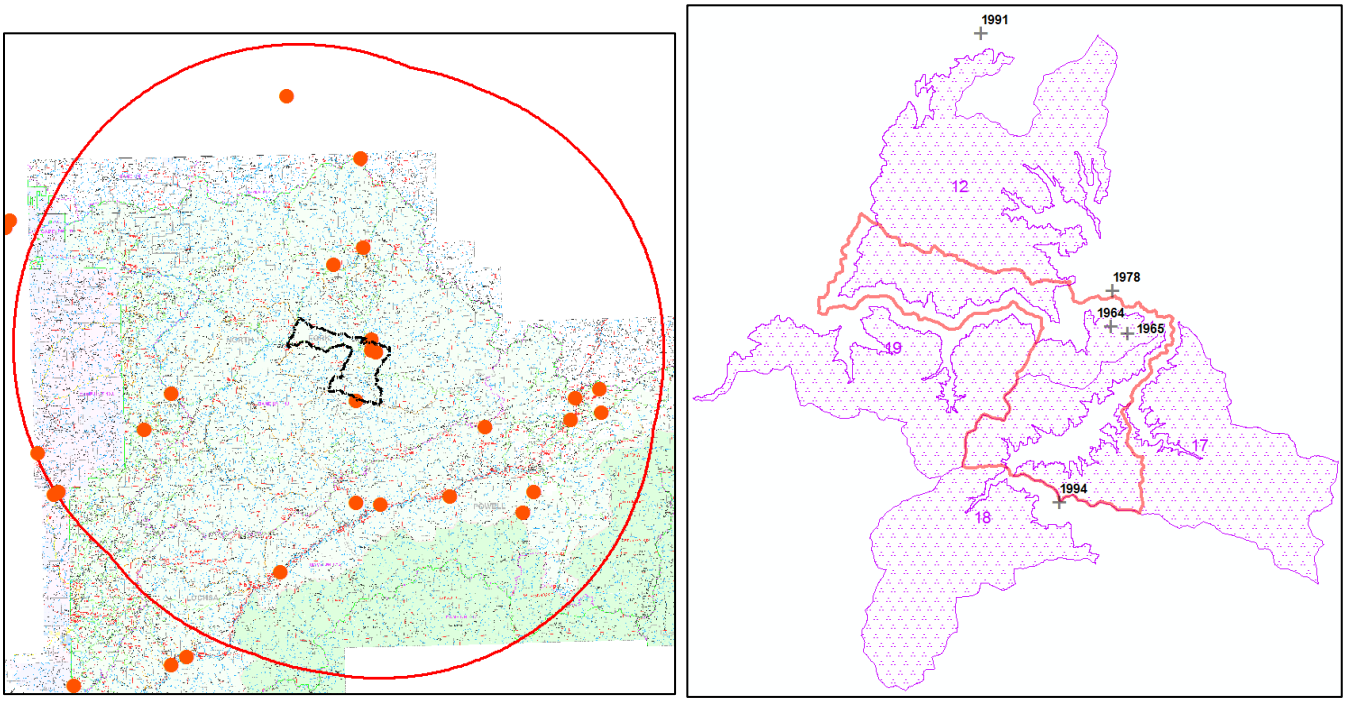
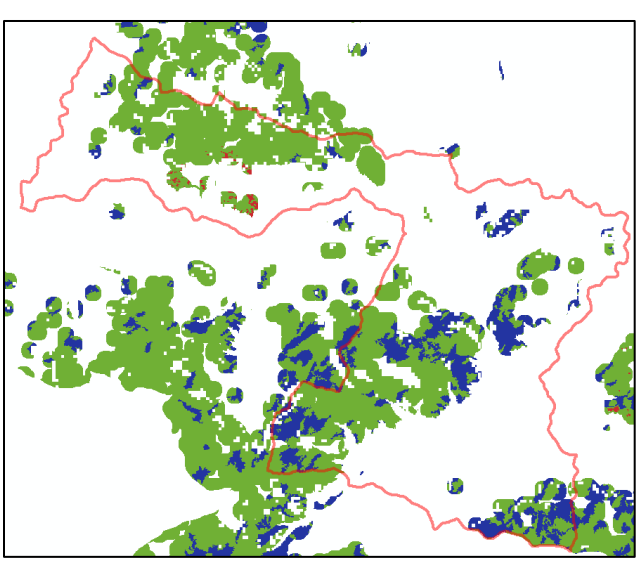
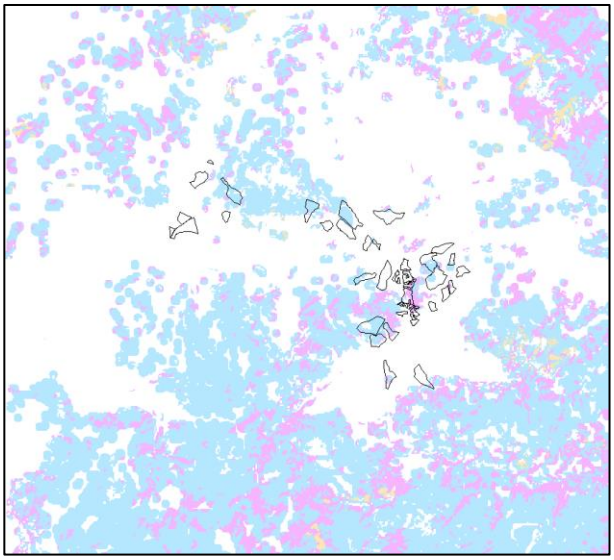


Figure 12. Lynx Habitat Relative to the Project Area and Units, and Figure 13. Lynx Habitat Relative to the Proposed Action Units.



Green = General Habitat, Blue = Denning Habitat,
Red = Currently Unsuitable



Light Blue = General Habitat, Pink = Denning Habitat
Orange = Currently Unsuitable

North American Wolverine

North American Wolverine is currently proposed for consideration as a threatened species, but no critical habitat has been designated. Activities proposed include: mechanical equipment use (including helicopter for prescribed fire ignition), habitat maintenance and restoration (timber harvest, roads, meadow and/or aspen stand maintenance and restoration), and prescribed fire (general support, ignition, control, and mop-up).

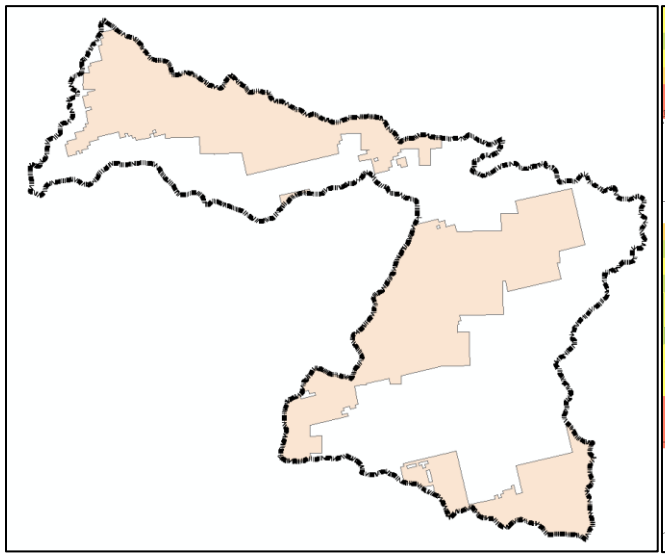
There are about 20 sighting records of wolverine on the District, one of which is in the Project area (1976 Cayuse Creek by landing strip). Additionally, there was a 2017 detection record near Hoodoo Pass, about 17 miles north of the project area. Habitat acres in project area include 7,908 acres of persistent snow and 10,837 acres of primary habitat. The primary or secondary threats to the wolverine Distinct Population Segment (DPS) are identified as climate change, inadequate regulation of climate change, harvest, and small population size. Wolverine are able to adjust to and co-exist with moderate levels of disturbance. The analysis area for wolverine includes 12,025 acres, which is the combined snow and primary modeled habitat areas (Figure 15).

Grizzly Bear

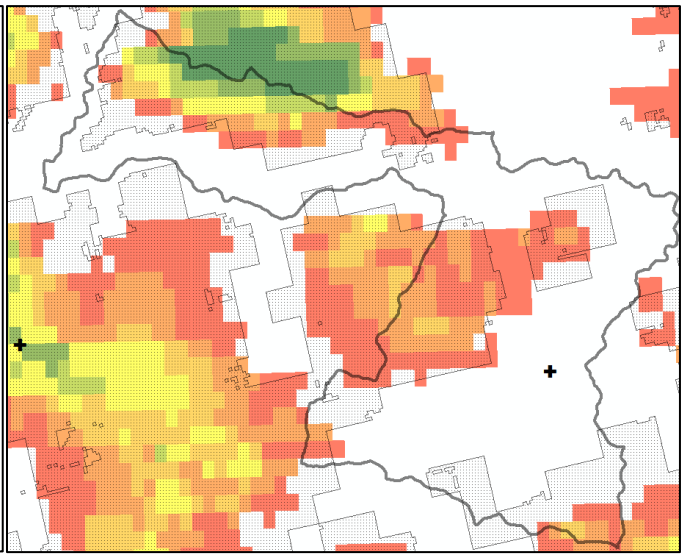
The grizzly bear is listed as a threatened species known or believed to occur in Clearwater and Idaho Counties. Anecdotal and unverified sightings of grizzly bears on the Forests occur infrequently. Forest records show reports as much as every few years to a few every decade. Approximately 25% of black bears on the forest are not black-colored, which can make accurate species identification difficult even for experienced observers. The Bitterroot Recovery Zone, an experimental non-essential population area in the Bitterroot Mountains of east-central Idaho and western Montana, is not known to contain grizzly bears at this time, but sightings indicating dispersal in proximity to the Recovery Zone are increasing.

Until 2007, when a grizzly was killed in the immediate vicinity of the project area, it was widely accepted that there were no grizzly bears in the Bitterroot ecosystem. DNA from the killed grizzly, show the bear was transient from the Selkirk ecosystem. Camera and extensive hair sampling surveys were conducted in 2008-2009, but failed to detect grizzly bears. There are 50-80 sighting records on the North Fork Ranger District, primarily from the 1950s-1980s.

Figure 14. Wolverine Analysis Area and Figure 15. Wolverine Habitat in the Project Area.



Inman Wolverine Primary Habitat Model (pink) within the East Saddle Project Area (dashed line).



Copeland Persistent Snow Model – Green = More Persistent, Red = Less Persistent

VI. EFFECTS ON THREATENED, ENDANGERED, AND PROPOSED SPECIES

A. Aquatic Endangered Species Act Listed Species

Bull trout and bull trout critical habitat. Background. Bull trout were listed as threatened under the Endangered Species Act on June 10, 1998 by the U.S. Fish and Wildlife Service (USFWS, 63 FR 31693). The USFWS designated critical habitat for Columbia River Basin bull trout in the lower and upper North Fork Clearwater River (NFCR) subbasins on November 17, 2010 (75 FR 63898). The critical habitat (CH) designation in the East Saddle project area includes the mainstems of the NFCR, Kelly Creek, and Cayuse Creek which are foraging, migration, and overwintering (FMO) CH, and Moose Creek, which is spawning and rearing (SR) CH (Figures 2, 3, 16, and 17). The portion of Moose Creek within the project area (approximately the lower 1 mile) is probably more accurately described (because water temperatures exceed early rearing suitability) as FMO habitat, however (see water temperature data and discussion on page 34) .

Distribution. Resident, fluvial and adfluvial populations of bull trout were historically distributed throughout the Pacific Northwest in the United States and western Canada. Resident and fluvial populations occurred throughout the Snake River basin including the NFCR and its tributaries. Bull trout co-evolved with redband trout (*Oncorhynchus mykiss gairdneri*), westslope cutthroat trout (*O. clarki lewisi*), Chinook salmon (*O. tshawytscha*), and mountain whitefish (*Prosopium williamsoni*). Recent surveys in the known range of bull trout in Idaho have shown metapopulations in widely scattered segments of river basins (Rieman and McIntyre 1993), as well as in isolated catchments. Bull trout populations are present in about a dozen subwatersheds in the combined upper and lower NFCR subbasins on the Clearwater National Forest (CNF).

In relationship to the proposed action, bull trout presently occur in the NFCR drainage on the North Fork Ranger District. These fish spawn and rear young in many of the tributaries the NFCR (USFWS 2002), but the mainstem of the river and the lower reaches of many of the tributaries are not considered to be spawning or early (i.e., first year) rearing habitat. The mainstem of the NFCR is thought to harbor adult and advanced juvenile fluvial (i.e., large-river dwelling) bull trout year-around and is known to serve as a migratory corridor for adult and advanced juvenile fluvial and adfluvial (lake-dwelling) bull trout during the spring and fall. In addition, and as noted above, some subadult fluvial and adfluvial bull trout are known to "wander" into habitat which may not be suitable for spawning or early rearing (as opposed to migration to or from spawning and/or early rearing habitat) and may exist for short or long periods in streams reaches that otherwise would be unoccupied or used only as a migratory corridor (Howell et al. 2016). Full-time residents of the tributary streams where fluvial and adfluvial fish spawn and conduct early rearing are the third bull trout life history type known to occur in the NFCR drainage.

Presence in Action Area. Native fish species in streams within the project area and its subwatersheds (Figures 4 and 5) include westslope cutthroat trout, redband rainbow trout, and mountain whitefish. Anadromous aquatic species originally inhabited the NFCR and tributaries, but have been blocked from accessing the project area for about 40 years by Dworshak Dam. Introduced kokanee (*O. nerka*) make spawning migrations into or through the project area reaches of the larger streams in the project area) in most years.

Bull trout likely occur year-around in the project area reaches of the NFCR, Kelly Creek, Cayuse Creek, and Moose Creek, as well as along the potential timber haul routes adjacent to these streams (less Cayuse Creek) the upper NFCR tributary, Long Creek. The CNF contracted for extensive fish habitat and snorkeling surveys in the 1990s in many streams on the North Fork and Lochsa Ranger Districts, including the NFCR (Clearwater BioStudies (CBS) 1999) and Moose Creek (CBS 1991), but the project reaches of Kelly, Cayuse, Clayton, Gorman or any other named streams in the project area were not sampled. In a radiotelemetry study conducted by the Idaho Department of Fish and Game (IDFG, Hanson et al. 2014), IDFG radio-tracked several hundred adult bull trout in Dworshak Reservoir and its tributaries, documenting many of adfluvial fish migrating through the project reaches of the NFCR and Kelly Creek. Hanson et al. (2014) also documented a few adfluvial adult bull

trout migrating through the project reaches of Moose and Cayuse creeks. Hanson et al. (2014) further documented several dozen snorkel surveys in the upper NFCR, Kelly Creek, Cayuse Creek, and Moose Creek watersheds from 2003-2005 (some in the project area), with bull trout present in many; many other IDFG surveys have likely been performed in these watersheds over the years which confirm the presence of bull trout.

With the exception of the mainstem stream segments discussed in the previous paragraph and electrofishing surveys at two sites each in the Clayton and Gorman Creek drainages in 2017 (Kenney, unpublished data) and 2012 Idaho Department of Environmental Quality survey in Slide Creek in 2012--no bull trout were detected in any of these 3 streams--the District has no records of fish surveys in any other stream in the project area.

The initial bull trout draft recovery plan (USFWS 2002) and the final version of the document (USFWS 2015) discuss sampling efforts and professional judgments of knowledgeable biologists regarding presence and distribution of bull trout in streams and drainages in the North Fork Clearwater subbasins, and identify "local populations" in each of the four project watersheds, but document only the presence of adult and subadult bull trout in the project area stream reaches.

Because bull trout are mostly migratory in behavior and can sometimes be found in streams which do not presently support breeding populations, it is possible that one or more bull trout could exist in the non-CH project area streams (especially in the lower few hundred meters of the larger streams) during project implementation. Timber harvest (and haul) and road work also have the potential to degrade riparian and instream habitat if not properly conducted, and water quality degradation can be transmitted downstream of project operations.

In summary, bull trout are present seasonally as adfluvial migratory adult and subadults in the mainstems of the NFCR, Kelly Creek, Cayuse Creek, and Moose Creek in the project area, and these streams likely also support fluvial adult and subadult bull trout year-around. Clayton, Gorman, Slide and other project area streams (13 other named streams as well as many unnamed streams) have no sampling record, but are small and generally steep and thus unlikely to support bull trout spawning or rearing. As noted above, some subadult bull trout are known to "wander" into habitat which may not be suitable for spawning or early rearing, so it is possible that a few transient subadults originating outside of the project area could be present in the lower reaches of Clayton Creek or other small fishbearing streams directly tributary to migratory habitat at any time of year, but probably not in the high-gradient upper reaches of these streams and their tributaries, where most proposed in-water work or RHCA encroachment by prescribed fire would occur. Other than the mainstem stream reaches named above, the likelihood of any transient or wandering individual bull trout being present at any particular project stream reach at any particular time, is very low.

Potential Project Impacts. Potential adverse effects to bull trout from any general action can be direct, as in redd disturbance by heavy equipment, or indirect, as in increases in fine sediment due to ground disturbance. For this specific proposed project, activities proposed within the stream channel that have the potential for direct injury to individual fish present include excavation of or for culverts and other stream crossings on road prisms and the crossing of vehicles and heavy equipment at fords or sites with recently-removed culverts. Vegetation treatments and associated activities can theoretically have indirect effects on bull trout related to stream sedimentation, channel modification, and reduction in shade and large woody debris, but project design and mitigation measures are intended to prevent or greatly reduce such effects.

Direct effects. Some of the road-related activities associated with the proposed action (especially culvert replacement, and storage and decommissioning of roads) would take place within stream channels, and in-water work would have some potential to cause direct injury or mortality to individual bull trout through mechanical injury or localized and brief changes in water quality, especially high turbidity, if individuals are in proximity to the project sites; however, no in-water activities would be implemented in bull trout designated critical habitat, and bull trout would not be present at in-water work sites, except in the unlikely scenario that a transient were present. There is also some potential for fuel or other contaminant spills into stream channels from vehicles or

heavy equipment used for the road-related activities of the proposed action, including log yarding and hauling. The impacts of road-related activities within RHCAs would be minimized and mitigated through design features (particularly Aquatics Mitigation Measures 4, 6, 7, and 9 in Section IV) to reduce potential direct impacts on bull trout and other stream and riparian species.

Per the discussion above, the proposed in-stream activities in fishbearing streams (Figures 3 and 16) for Clayton and Gorman creeks and their unnamed tributaries (UTs) would occur a minimum of about 0.6 miles upstream (the Gorman Creek culvert replacement) from the nearest documented presence of an individual adult bull trout in Cayuse Creek, so no direct mechanical injury would likely occur. (The comparable distance for the NFCR is 1.4 miles upstream (the culvert temporary placement/removal on Clayton Creek). As described above, the project area would not have any spawning adult bull trout, bull trout redds, or early rearing juveniles present, but the presence of a few "wandering" non-spawning adults or subadults in the lower reaches of one or a few of the larger streams cannot be ruled out (but note that Clayton and Gorman creeks at the subject sites are very small (see Figures 19, 20, and 21). The instream culvert removal or replacement described above could potentially directly affect individual bull trout through mechanical injury, although any adult or subadult bull trout present are likely to be agile and alert enough to move away from and so avoid harm from activities such as culvert excavation and stream crossings by heavy equipment.

Another mechanism for the potential direct injury or mortality to bull trout would be the transmission of toxic substances (gasoline, oil, grease, etc.) into streams from fuel spills or leaky or dirty equipment, or the generation and downstream transmission of very high levels of fine sediment from stream crossing or culvert rehabilitation (Muck 2010). As noted above, there are up to 5 sites where heavy equipment would be used to excavate in a fish-bearing stream channel (Figure 3, Table 5) and the closest culvert to documented bull trout presence is about 0.6 miles upstream.

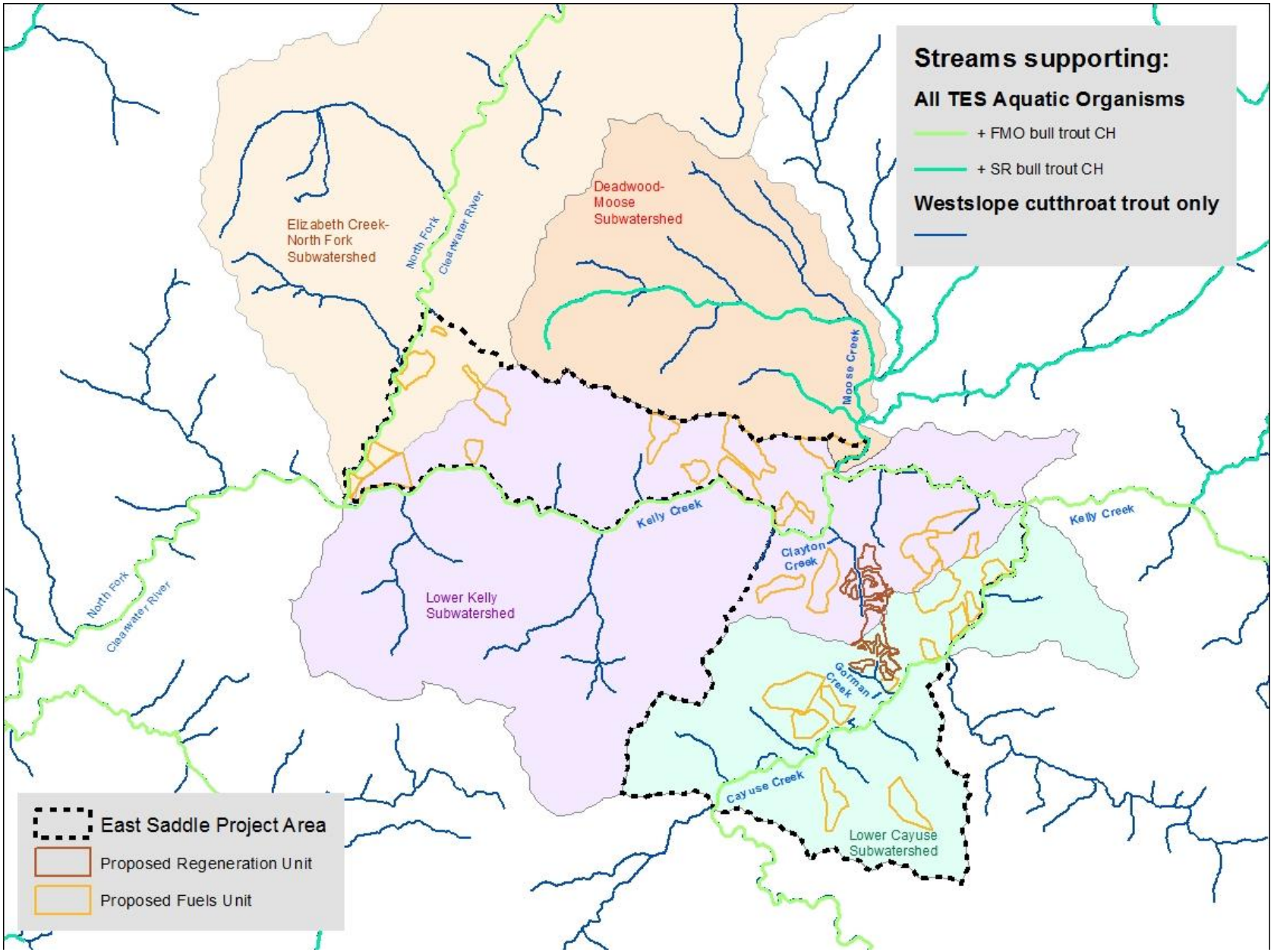


Figure 16. East Saddle project area subwatersheds showing vegetation treatment units and fish presence.

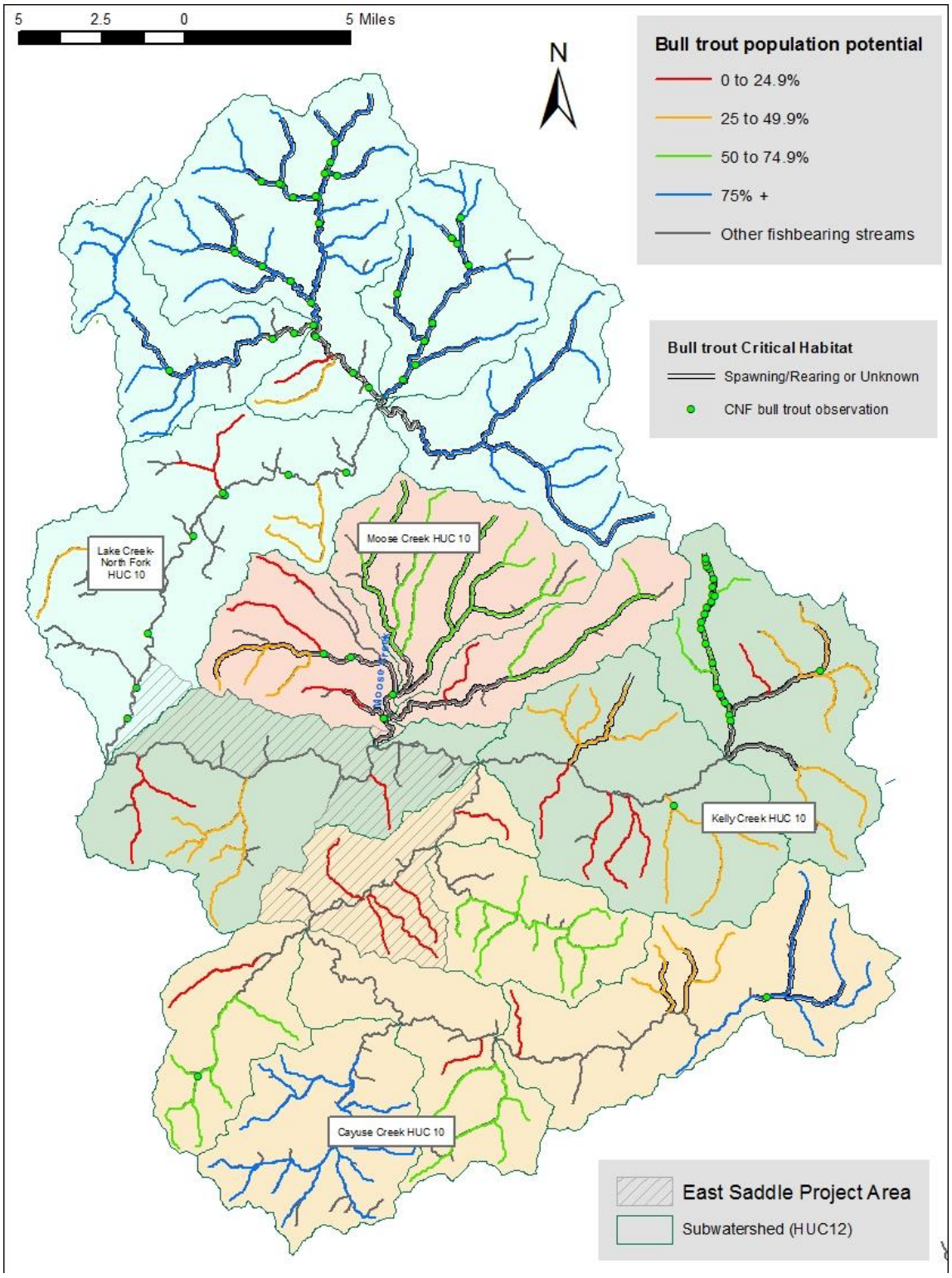


Figure 17. Bull trout observed presence, predicted presence, and non-FMO critical habitat in the project watersheds. Observed bull trout locations are only for CNF contract surveys in 1990s—IDFG survey sites are more numerous, but do not alter general distribution and are not shown. Predicted presence from Climate Shield geospatial model of likely spawning/early rearing reaches (https://www.fs.fed.us/rm/boise/AWAE/projects/ClimateShield/maps.html).

Of the ~19 crossings of non-fishbearing streams where in-stream work is proposed (Figure 3), the closest instream activity to documented bull trout presence/habitat from any potential culvert removal or replacement site at a non-fishbearing stream (per our GIS layer) in the Lower Kelly or Lower Cayuse subwatersheds is a site on the 581 road crossed by an unnamed direct tributary about 0.3 miles upstream from Cayuse Creek. The comparable distances for Kelly Creek is a crossing of the 581 road about 0.5 miles upstream (a Clayton Creek unnamed tributary culvert replacement). The size of the non-fishbearing tributaries in which there would potentially be in-stream work is shown in Figures 22 and 23.

Because of Aquatic Mitigation Measures #6 in Section IV and the relatively large dilution effect of the flow volume of Kelly Creek and Cayuse Creek for road work in the project area, the potential for direct harm to individuals from very high levels of project-generated fine sediment would be very low for activities in tributaries and sub-tributaries of this stream in the project area. This is because sediment transmission and ensuing temporary high turbidity would be substantially attenuated within less than one hundred feet (see Indirect Effects section, below) prior to reaching streams which support bull trout (CNF 2009).

For fuel storage and for log haul, whether within or outside of the project area, Aquatic Mitigation Measure #9 in Section IV should minimize the potential for direct harm to bull trout. Further, substantial spills of fuel associated with fuel storage or log haul are very rare, and as such would be speculative and discountable.

In the long-term, while in-water work would have a negligible potential (for reasons discussed above) to injure or kill individual bull trout during project implementation, culvert replacement and the storage and decommissioning of roads in riparian areas may benefit the few transient individuals by reducing the potential for injury or mortality caused by motor vehicles (primarily from fuel spills) and by reducing the potential for transmission of large slugs of fine sediment from culvert or fillslope failure, both of which are inherently more lethal and could potentially travel much farther downstream than carefully planned and executed culvert work.

Individual bull trout would be protected from regeneration harvest and fuel/elk habitat treatments (including yarding and post-harvest fuels reduction) under the proposed action through application of default RHCA buffers, so the risk of direct injury or mortality to bull trout from vegetation management-related project activities would be non-existent (see "Indirect Effects," below, for a discussion of potential fuel/elk habitat treatments in default RHCAs). There would be some potential for a toxic spill to occur into a stream channel if a log-hauling truck or yarding equipment were to be disabled in an accident or through vandalism, or if a broadcast burn went greatly out of prescription, but such an occurrence is very unlikely and entirely speculative.

Given that bull trout should not be present at the project sites where in-water work would occur and that the potential sources of injury through effects to RHCA vegetation, fine sediment input, or fuel contamination would be rare and mitigated, direct effects to individual bull trout should be very unlikely and so discountable.

Indirect effects. Timber harvest, other vegetation treatments, and road-related activities can have indirect effects on stream salmonid habitat primarily through changes in water yield, sediment production, and modification of riparian vegetation. Large increases in water yield can destabilize stream channels and banks, increase fine sediment input, and increase water temperature. Timber harvest and road-related activities can disturb soil that would potentially be transmitted to stream channels, where fine sediment can alter stream channel and water quality characteristics. Timber harvest in riparian areas can affect stream shading and large woody debris recruitment. The changes in stream channel, water quality, and riparian characteristics associated with the effects of substantially increased water yield and sediment transmission would tend to reduce aquatic habitat quality, especially through reductions in water and spawning substrate quality and in prey production.

Figures 18, 19, 20, and 21. From upper left and continuing clockwise: Figure 18. Kelly Creek looking downstream from 581 bridge; Moose Creek enters from right. Figure 19. Clayton Creek at FR 582 crossing. Figure 20. Clayton Creek unnamed tributary, at FR 582 crossing. Figure 21. Gorman Creek, about 1,000 feet upstream of Cayuse Creek confluence.


Figures 22 and 23. Unnamed tributaries of Clayton Creek below FR 581 crossings. Staff is 1.5 m in height.

The nearest regeneration harvest unit to a stream with documented bull trout presence, is the lower corner of Unit T22 (Figures 2 and 3). The lower point on this unit would be about 150 feet (the INFISH buffer width) from a non-fishbearing tributary of Cayuse Creek, which in turn would be approximately 1,300 feet from its confluence with the latter bull trout-supporting and CH stream. The lower point on this unit would also be about 1,300 feet upslope from Cayuse Creek. The comparable information for the nearest regeneration harvest unit in the Lower Kelly subwatershed is Unit T5A, which has a 300-foot INFISH buffer on Clayton Creek at a point about 4,000 feet from the Kelly Creek confluence. Distances from planned in-stream activities sites to bull trout/bull trout CH are discussed under "Direct Effects," above.

Several fuels/elk habitat units shown in Figures 2 and 3 overlap with the outer portions of some INFISH RHCA default buffers (not shown on maps), including the outer portions of the default buffers on bull trout CH streams (the NFCR, and Kelly, Cayuse, and Moose creeks), as well as within or across the buffers of many streams without fish or bull trout CH. However, as discussed in detail in Section III, fuel/elk habitat/aspen treatments would be performed in a manner which would avoid direct effects to fish and would have minimal and only temporary effects on vegetation and soils in the outer areas of default INFISH RHCA buffers. In particular, prescription burns would be ignited only under vegetative and soil conditions that would be adverse to propagation in core riparian areas, and would not be ignited within default RHCA buffers (Aquatic Mitigation Measure #2). Slashing or piling of vegetation in fuels/elk habitat/aspen units (also described in Section III) would not be performed in default RHCA buffers. It should be noted that INFISH Standards FM-1 and 4 anticipate fuel treatments that avoid degradation/-contribute to attainment of Riparian Management Objections and which minimize disturbance of riparian ground cover and vegetation.

While unmitigated and/or excessive timber harvest or fuel treatments can have negative effects on stream organisms, implementation of riparian no-cut/no ignition buffers, as discussed above, can greatly reduce or eliminate vegetation treatment-related indirect effects on bull trout and other aquatic organisms. In the proposed project, fishbearing streams, their tributaries and the riparian areas of both would be protected from regeneration harvest, fuels reduction, and elk habitat improvement activities through recognition of default RHCA buffers, so the risk of indirect injury though habitat degradation should be minimal to nonexistent. In addition to lack of direct effects in riparian areas described above, the RHCAs will act as "filter strips" to reduce or eliminate sediment transmission to streams from harvest units (Smith 2015, 2016). Traeumer (2018) discussed the reasoning behind the likely small magnitude ("immeasurable") in project related sediment production modeled by and the low likelihood of other indirect effects to project area streams. Regeneration harvest would be avoided on "landslide prone" areas and the route of temporary roads would be chosen to reduce the risk of mass soil movement (Crook 2018).

Compared to upland activities, soil disturbed during decommissioning or storage activities, road reconstruction, or culvert placement/replacement at stream or seep crossings or in riparian areas would have a greater potential to enter stream channels during project implementation and over time. Specifically for upland road decommissioning/storage and reconstruction, some of this soil would have the potential to be transmitted downhill until stabilized. Growth of vegetation on decommissioned/stored road prisms may be enhanced by soil decompaction, live transplants, duff placement woody debris application and seeding. The majority of the soil disturbed by project activities would occur hundreds of feet or more from stream channels. Vegetation, downed woody material, duff, or topographical features should intercept and stabilize any immobilized soil before reaching a stream.

As discussed above, upland vegetation management and most road reconstruction activities (blading and drainage feature construction and maintenance) would not involve in-stream work and would occur (with the exception of the reconstruction of the approach to the FR 581 bridge over Kelly Creek) at least 300 feet from bull trout CH, and so any fine sediment transmitted off of road prisms associated with these units/road segments should be stabilized well before reaching bull trout streams. It is possible that large-scale landslides or debris flows may originate from the road prisms within the project area and propagate all of the way to channels with known bull trout presence, but the project design and mitigation measures are intended to reduce the likelihood of such an event.

Compared to upland activities, soil disturbed at stream or seep crossings or in riparian areas would have a greater potential to enter stream channels during project implementation and over time, but Mitigation Measures/BMPs (Section IV) that would minimize sediment inputs to streams during culvert removal and stream crossing stabilization would be implemented. BMPs include dewatering of the site during crossing removal and the placement of sediment catching devices (straw bales, brush dams, settling basins) around the work area and in the stream channel.

Even with BMPs, however, culvert removals would contribute to short-term increases in stream sediment and turbidity levels primarily caused by disturbance of existing instream sediments during channel recontouring and rewatering activities. Monitoring on the Forest has shown that peak sediment input occurs immediately upon culvert removal and stream disturbance, followed by a decrease in sediment transport and turbidity within several hours and with increasing distance downstream, typically within 300-600 feet due to small stream size and the low flow during the dry season when work would occur (Connor 2014). Minor short-term sediment input is expected to occur over a short time frame (1-5 days per site) as the channel adjusts. Subsequent rain and snowmelt events through the following one or two springs are expected to cause short-term increases in sediment and turbidity at the rehabilitated crossing as vegetation reestablishes and stream channels stabilize. Based on the above, little or no fine sediment should reach sites with bull trout presence, and there should be little to no effect on the quality or quantity of designated bull trout critical habitat.

Further, road prisms primarily cross RHCAs and stream channels perpendicularly, so the area of impact to habitat would be relatively small compared to the full amount of RHCAs and stream channels in the project area. Because the area of impact should be relatively small, the reduction in shade and large woody debris recruitment associated with stream crossings of roads should be minor and biologically undetectable at the project area scale.

Water temperature can potentially be affected by fine sediment input (which can change stream channel morphology to reduce groundwater input and increase solar radiation) and by vegetative shading (reductions in which can increase solar radiation).

The Forests periodically monitors water temperature at stream sites and there are thermograph sites on Clayton, Moose, and Kelly creeks within or on the boundary of the project area. The Clayton Creek and Moose Creek sites are located just above the confluences of these streams with Kelly Creek, while the Kelly Creek thermograph site

is located about a mile upstream from the junction of Kelly Creek with the NFCR. Data for one or more of the sites is available from 1994 through 2013, although not for every year within this period. The peak maximum weekly mean temperature (MWMT) for Clayton Creek in 8 years during this period ranged from 10.7 to 14.2° C; with a mean of 12.5° C. The comparable values for Moose Creek (with 17 years of data) is 16.6 to 22.5° C (a mean of 19.3° C), and Kelly Creek (with 9 years of data), is 17.9 to 21.9° C (a mean of 19.3° C). Both Moose and Kelly creeks are much larger streams than Clayton Creek, so the disparity observed is to be expected.

The observed temperature profile for Clayton Creek, which drains much of the regeneration harvest portion of the proposed project area, are near the cool end of the "Functioning at Risk" (USFWS 1998) range for juvenile bull trout rearing, but this stream is much too small and steep to function as spawning habitat for bull trout. Nevertheless, the RHCA buffers described above between Clayton Creek (and its tributaries) and harvest units should ensure that effects to stream shading would be avoided, and that water temperatures in these streams and Kelly Creek should not be affected by timber harvest.

The values for Moose and Kelly creeks (based on USFWS 1998), are well within the unsuitable ("Functioning at Unacceptable Risk") range for bull trout migratory and rearing/foraging habitat. Assuming that at least some of the excessive (for bull trout) thermal load is the result of anthropogenic alteration, it would not be desirable to increase these measured temperatures with influence from the proposed project. The effects of RHCA buffers described above for fuels/elk habitat units, however, demonstrate that the action alternatives would minimize or eliminate effects on sediment transmission and stream shading so that additional thermal increases on existing stream water temperature should not occur or be measurable.

Culverts (especially undersized culverts) can fail during high flow events, resulting in the rapid erosion of large amounts of road fill and surface into both fishbearing and non-fishbearing stream channels. Roads are also a source of chronic sedimentation of stream channels through erosion of fill and cutslopes and of the running surface, especially if not adequately maintained. In the long-term, culvert replacement (with larger pipes), and storage and decommissioning of roads in riparian areas should benefit stream habitat in Clayton and Gorman creeks and bull trout habitat downstream in Kelly and Cayuse creeks by reducing the potential for sedimentation.

Traeumer (2018) also estimates that the rocking of reconstructed road, and road decommissioning and storage for the proposed action would reduce sediment production and benefit water quality. Because the road rocking, road decommissioning and storage activities would not necessarily be coincident or shortly following vegetation manipulation and road construction/reconstruction, it cannot be said that the proposed action would result in a net reduction in sediment production in the project area for the proposed action. However, as discussed above, sediment yield from the primary project activities should be minimal and non-measurable, so indirect effects on bull trout should be similarly negligible. When completed, the reduction in sediment production associated with road rocking, road storage and decommissioning should tend to improve aquatic habitat quality in the long term.

Based on the hydrology specialist report for this project (Traeumer 2018), harvest and road-related activities under the proposed project would slightly increase water yields, but the increase would be well within the range considered natural for the project area and so should not alter stream habitat quality to a measurable or biologically significant degree. The road rocking, road decommissioning and storage should reduce water yields proportional with the amount of these activities implemented, which should reduce the potential and magnitude of peak flow-induced channel erosion.

Summary. Few, if any, individual adult or subadult bull trout should be present in close proximity to the project activities with the greatest potential for direct effects. Bull trout individuals in Cayuse and Kelly Creek would be relatively distant from project activities, with the exception of timber haul and prescription burning in a few units. Vegetation management activities (including road construction, reconstruction, and fuels treatments) would have little if any effect on individuals of the species or on aquatic habitat because of project design and riparian buffers.

Other project activities (particularly road decommissioning, storage, and culvert replacement on retained roads) would reduce long-term sedimentation risks to project streams from chronic road prism erosion and culvert failures, such that there would be a long-term beneficial effect to aquatic habitats and species. Project design features, mitigation measures and BMPs would minimize temporary and short-term sediment transmission and suspension, so potential adverse impacts to streams from projects activities would be minor and temporary.

Effects of the proposed action on individual bull trout in the project area should be limited to possible temporary and site-specific impacts related to road decommissioning, storage, reconstruction, culvert replacement, and log hauling. The road-related activities would be largely harmless to any fish in the project area because of project design, BMPs, and mitigation measures, while bull trout in particular would be very unlikely to be affected by any of the activities because the only individuals potentially present during in water activities would be, at most, few and transient. In addition, if any bull trout are present at culvert removal/replacement sites, they would be wary, perceptive, and highly mobile subadult or adult individuals of a size that would permit rapid movement away from activity sites, and so such individuals would be unlikely to be harmed by the proposed activities.

Also specific to bull trout, turbidity or suspended sediment would enter or be mobilized in the fishbearing and non-fishbearing stream channels discussed above as the result of proposed project activity, but the degree and duration of these sediment pulses would be moderated or nearly eliminated by the project design and implemented mitigation measures, such that little or no sediment transmission should reach stream segments known or documented to support bull trout. Additionally, because of project design and mitigation measures, the proposed activities should have no biologically significant impact on water temperature, large woody debris recruitment, streambank stability, and other riparian and instream indicators in the project area. The road-related activities may affect aquatic habitat in and just downstream of the project at the site-specific and temporary scales, but in aggregate and in the long term should improve watershed conditions and therefore bull trout habitat.

In conclusion, all potential effects on bull trout or bull trout habitat have been eliminated or minimized to biological insignificance through project location, design, and the mitigation measures that would be implemented. No in-water activities would occur in occupied bull trout habitat and because the risk of the transmission of substantial amounts of contaminants to bull trout habitat would be very low, the risk of direct adverse effects on individual bull trout as a result of the proposed activity should be considered to be very low to nil. For similar reasons, no indirect effects to bull trout or bull trout habitat should be manifested.

Bull Trout Critical Habitat: The designation of the mainstems of the NFCR, Kelly Creek, Cayuse Creek, and Moose Creek within the project area (and for CH streams in proximity to potential timber haul routes outside of the project area) requires the Forest to consult with the USFWS on any agency action which is likely to result in a may affect determination. The nine primary constituent elements (PCEs) listed in the proposed rule and any potential impacts associated with the vegetation management, culvert removal/replacement, and road decommissioning/storage activities are summarized below:

- *Springs, seeps, groundwater sources, and subsurface water connectivity (hyporheic flows) to contribute to water quality and quantity and provide thermal refugia.* Implementation of the proposed action would tend to restore the natural hydrologic functioning of the project area through elimination of flow diversion onto some of the project road segments that would be decommissioned or put in storage and elimination of some potential future diversions. Restoration of hydrologic functioning should positively affect, at a relatively small scale, the quantity and quality of subsurface flows, springs and seeps.

- *Migration habitats with minimal physical, biological, or water quality impediments between spawning, rearing, overwintering, and freshwater and marine foraging habitats, including but not limited to permanent, partial, intermittent or seasonal barriers.* The mitigation measures are expected to avoid or minimize any adverse impacts to spawning, rearing and migratory of bull trout because all of the proposed instream activities would

occur in portions of the Lower Kelly and Cayuse Creek subwatersheds separate from, and mostly remote from the designated critical habitat in the mainstems of these streams. No biologically significant effects should be transmitted to portions of these streams.

- *An abundant food base, including terrestrial organisms of riparian origin, aquatic macroinvertebrates, and forage fish.* With the exception of changes to substrate conditions in small, localized areas associated with road decommissioning and storage and for a few feet downstream of the culvert replacement sites (which may cause small and transitory changes to macroinvertebrate abundance and diversity in a few hundred feet of stream well upstream of known bull trout presence and critical habitat), the project activities are expected to have no adverse impacts to this element.

- *Complex river, stream, lake, reservoir, and marine shoreline aquatic environments and processes that establish and maintain these aquatic environments, with features such as large wood, side channels, pools, undercut banks and unembedded substrates, to provide a variety of depths, gradients, velocities, and structure.* With the exception of vegetation, substrate, channel, and streambank modifications at and adjacent to some of the road decommissioning and storage and at the culvert replacement sites (which may cause small and transitory changes in stream and riparian characteristics to a few hundred feet of stream well upstream of bull trout presence and critical habitat) the proposed activities are expected to have no adverse impacts to this element.

- *Water temperatures ranging from 2 to 15 °C with adequate thermal refugia available for temperatures that exceed the upper end of this range. Specific temperatures within this range will depend on bull trout life-history stage and form; geography; elevation; diurnal and seasonal variation; shading, such as that provided by riparian habitat; streamflow; and local groundwater influence*. Vegetation management activities would be buffered with default RHCA widths, so these activities should have no effect on stream shading. Metal culverts in the project area would be replaced with larger culverts installed to facilitate Aquatic Organism Passage, so no increase in insolation would occur. Existing culverts on non-fishbearing streams that would be removed as part of decommissioning or storage activities and these culverts currently provide partial to complete shade for their lengths, the proposed daylighting of the 20-40 feet of stream when culverts are removed may cause some immeasurable increase in water temperature in the affected stream channels. Because of the tiny proportion of the length of any of the very small streams that would be affected by the culvert removal, there should be no measureable or long-term increase in water temperature in bull trout critical habitat (many miles downstream) as a result of the proposed action.

- *In spawning and rearing areas, substrate of sufficient amount, size, and composition to ensure success of egg and embryo overwinter survival, fry emergence, and young-of-the-year and juvenile survival. A minimal amount of fine sediment, generally ranging in size from silt to coarse sand, embedded in larger substrates, is characteristic of these conditions. The size and amounts of fine sediment suitable to bull trout will likely vary from system to system.* As noted above, sediment impacts from the proposed project activities will be negligible to nonexistent regarding direct effects to bull trout and direct and indirect effects to existing and potential habitats. RHCA default buffers on vegetation management units should filter any biologically significant amounts from transmission into project areas streams. Other than localized, short-term changes to water quality (turbidity) and substrate conditions (sediment levels) at and for up to a few hundred feet downstream from the road decommissioning/storage/culvert removal sites (and outside of critical habitat), no significant changes in substrate conditions are expected.

- *A natural hydrograph, including peak, high, low, and base flows within historic and seasonal ranges or, if flows are controlled, minimal flow departures from a natural hydrograph.* The hydrographs for all streams within and above the project area are un-regulated. Some of the project activities are expected to move hydrologic function of the project area slightly closer to the natural condition than currently existing and so Kelly Creek and Cayuse Creek should maintain or move closer to favorable hydrographs.

- *Sufficient water quality and quantity such that normal reproduction, growth and survival are not inhibited*. As noted in the effects analysis above, proposed project activities will have negligible effects to designated critical habitat because all in-channel activities would occur at substantial distances from critical habitat: at least 600 stream feet from Cayuse Creek, and at least 1.4 stream miles from Kelly Creek. The project design and mitigation measures are expected to eliminate or greatly minimize any transmission of effects to critical habitat.

- *Sufficiently low levels of occurrence of nonnative predatory (e.g., lake trout, walleye, northern pike, smallmouth bass); interbreeding (e.g., brook trout); or competing (e.g., brown trout) species that, if present, are adequately temporally and spatially isolated from bull trout*. The proposed activities are expected to have no adverse impacts to this element because brook trout are not known to be present in any of the project area subwatersheds.

B. Terrestrial ESA Species

Canada Lynx. Disturbance. Disturbance effects could be realized because regeneration harvest would occur in the interspersed cedar-hemlock, grand fir, and Douglas-fir forests that support snowshoe hares and may provide foraging habitat for Canada lynx in the future. This vegetation management project would not reduce snowshoe hare habitat in multi-story mature or late successional forests. Proposed activities have potential to cause short-term disturbance to, or temporary displacement of, individual lynx if they were to be denning, foraging, or dispersing through the area during implementation. However, these effects are reduced to barely measurable levels (4% of analysis area, or 1% of each of the 4 hypothetical female home ranges) given the scale of the project in relation to the limited amounts of suitable available habitat, home range size, and mobility of the species. It is believed lynx could avoid the action area, despite the unknowns regarding sufficiency of adjacent habitat availability and how movements are allowed around the action area. This is in part because the project appears situated toward the edge or fringe of patchy atypical yet suitable habitat (Figures 12 and 13). Another reason suitable conditions for lynx movements should not be considerably reduced, is because the arrangement of the harvest footprint is concentrated in a roughly two square mile rectangle block. In conclusion, the Project would not present a barrier to lynx movements through the landscape and no injury or mortality of lynx is expected because of their high mobility and suspected limited actual use of the area.

Habitat Modification Literature (in Interagency Lynx Biology Team 2013)

Both timber harvest and prescribed fire can provide foraging habitat for lynx when the resulting stem densities or stand structure meet the habitat needs of snowshoe hare (Keith and Surrendi 1971; Fox 1978; Conroy et al. 1979; Wolff 1980; Parker et al. 1983; Litvaitis et al. 1985; Bailey et al. 1986; Monthey 1986; Koehler 1990*a*, *b*). Recently logged or burned forests can contribute herbaceous summer foods for snowshoe hares, and woody winter browse will develop on older sites (Fox 1978). The rate and quality of habitat development depends on site productivity, forest type and intensity of disturbance (Sullivan and Sullivan 1988; Koehler 1990*a*). Forest openings have different attributes, in terms of lynx habitat quality and likelihood of use, depending on whether they result from logging or burning activities. Overall, regeneration harvest and fuels treatments would result in recruitment of a high density of conifers and shrubs where such habitat is scare or not available.

Harvest: Lynx do not appear to hunt in openings in winter because lack of cover limits habitat for snowshoe hares (Mowat et al. 2000; Maletzke et al. 2008; Squires et al. 2010). When lynx do cross openings, they remain closer to forest edges compared to random tracks, with an average distance of 384 feet from the forest edge (Squires 2010). Another study concluded that openings created by regeneration harvest, where the distance-to-cover is greater than 325 feet, might restrict lynx movement and use patterns until the forest re-grows (Koehler 1990, speculation). Lynx prefer to travel within or adjacent to forested cover. The project, as proposed, would retain forested cover which would allow lynx to navigate around treated openings until such a time as those openings

would once again provide suitable habitat for lynx to travel through and use for foraging, generally ten to 30 years.

Fire: Natural fire plays an important role in creating the mosaic of vegetation patterns, forest stand ages, and structure that provide good lynx and snowshoe hare habitat (Agee 2000). Twenty years after fire, significantly higher hare pellet densities were found in stands with high sapling density as well as high forest edge. In another study, snowshoe hare (a primary prey species of lynx and fisher,) had increased densities further from hard edges (Berg 2010).

Habitat Modification- General Project

Habitat modifications would be long-term, but are relatively small scale compared to the analysis area or size of the average female home range. Vegetation management would modify lynx habitat through changing the composition and structure of vegetation. Some of the proposed activities would be designed to promote natural processes- including aspen rejuvenations and shrub field maintenance. Regeneration harvest and fuels treatment activities would not reduce stem density through thinning in young, dense conifers. Rather, regeneration harvest and fuels treatment activities should result in an increase of stem density that could create early successional stages exploited by snowshoe hares (Kilgore and Heinselman 1990, Veblen et al. 1998, Agee 2000).

Table 8. Proposed action overlap mapped habitat acreage (% of available in LAU)					
LAU	12	17	18	19	Totals
Total	452 (5)	50 (4)	482 (3)	225 (3)	1,208

The proposed action would contribute to a decrease in denning and foraging habitats, and a corresponding increase in currently unsuitable habitats in LAUs 12, 17, 18, and 19 (Tables 8 and 9). Initial short-term loss of denning and foraging habitats, would be recovered in the long-term, as regenerated or burned stands develop into foraging habitats over the next several decades. It is anticipated that reforestation combined with natural seeding, would result in a high density of young conifer stems and branches that should provide foraging habitat for lynx within 10 to 40 years.

Table 9. Amount of lynx habitat in project area and treatment units		
Habitat	*Project*	*Treatment (% of Project)*
Denning	2,035	189 (9)
General	6,570	1,019 (16)

A broad scale assessment has not been completed that substantiates different historic levels of SISS limits, but that would be beneficial for calibrating the habitat model. There are no known future private or state actions that would contribute to cumulative effects and future Forest actions would be subject to consultation would likely propose a couple other timber sales in the vicinity of Deception Saddle, a few miles north of the project area.

Habitat Modification- Timber Harvest & Reforestation

Openings & Woody Debris: Timber harvest has the potential to improve winter snowshoe hare habitat where it occurs in areas without developed understories or dense horizontal cover. The creation of openings through even aged timber harvest management results in forage production, but with some limitations on their qualitative value. Specifically, such openings lack cover adequate for snowshoe hare winter habitat, and there are 20 acres of modeled habitat where distance from cover would be further than 384 feet. The 5 to 20 leave trees per acre remaining in regeneration harvest units would be the only source of future down wood recruitment, so harvest followed by fuels activities would result in net loss of coarse woody debris. However, maximizing the size of

coarse woody debris retention across roughly 45 acres of interior future open forest stands could help provide future development of lynx denning habitat (Wildlife Project Design Feature #3).

Table 10. Regeneration Harvest Overlap with Mapped Habitat Acreage.			
LAU	*18*	*19*	*Total*
Denning	56	49	105
General	18	8	26
Total	74	57	131

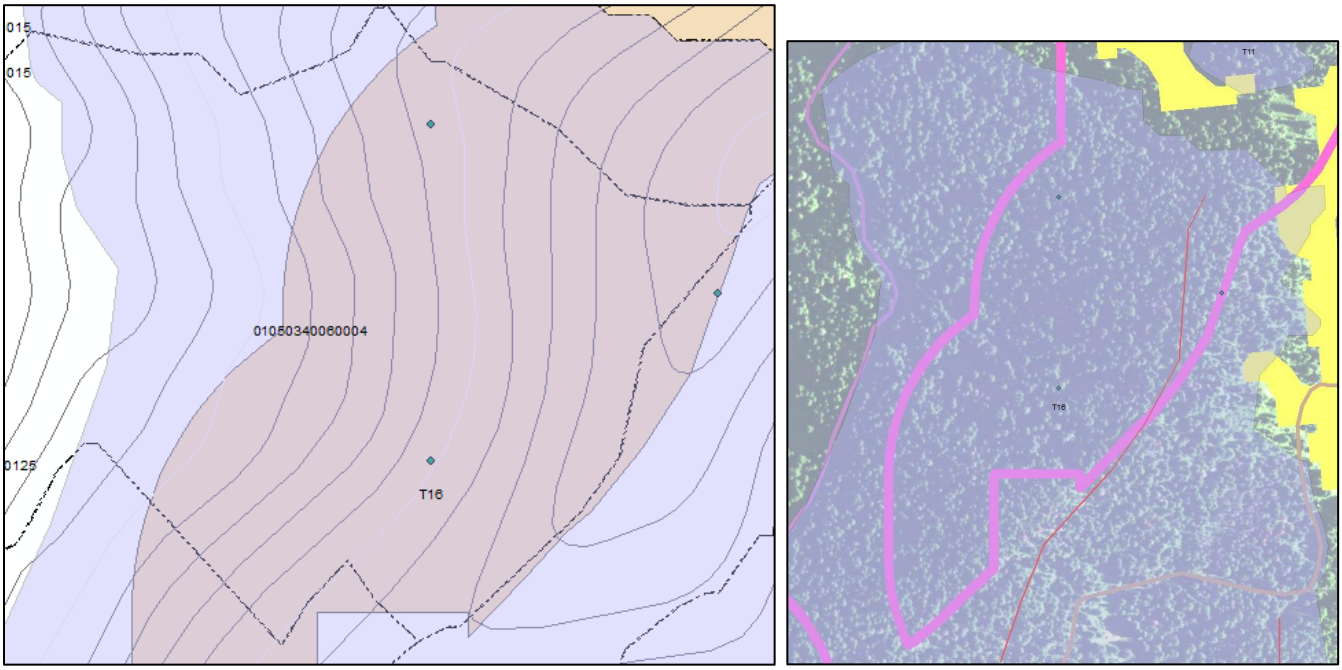
Leave Trees & Reforestation: The interdisciplinary team discussed methods for reducing the degree of effect to lynx habitat through leave tree species preferences, specifically stand 01050340060004 of unit T16 where modeled habitat overlaps regeneration harvest unit. Vegetation surveys indicate this stand supports 78 subalpine fir trees per acre, with an average height 82', and average age of 88 and therefore is not late successional. Additional surveys evaluated the structural condition and have ruled out multi-story conditions. The potential for planting of Engelmann spruce will be further explored in the prescription writing and implementation phase so as not to result in stand type conversion that would preclude future habitat development. However, retention of subalpine fir, Engelmann spruce, and lodgepole pine is not very feasible because it is counter to the purpose of the project and would likely result in high amounts of mortality of those species. This is because subalpine fir is very fire sensitive and generally suffers high mortality even from low intensity fires (USDA Fire Effects Information System). However, these species should naturally regenerate from the occasional mature tree which survives fire (in small, unburned pockets and adjacent to burned areas) that could provide seed to colonize burned sites, since subalpine fir relies on wind-dispersed seeds which readily germinate on fire-prepared seedbeds to colonize burned areas. These effects are applicable to the following fuels treatment section as well. Although all species regenerate well when bare mineral soil is exposed and seed source is available, site preparation with prescribed burning would have to be avoided in order to not kill the leave trees and since the slope is greater than 35%, the site can't be prepared mechanically, which leaves prescribed fire as the only option due to understory and brush competition limitations.

Habitat Modification- Fuels Treatments

Qualitative- Fire often results in beneficial effects when burned areas regenerate into lynx foraging habitat. Fuels treatment in units with modeled habitat in existing openings, would maintain grass or shrub lands that should improve snowshoe hare summer habitat. Additionally, through mimicking disturbance, prescribed burn units with modeled forested habitat could result in habitat improvements, provided they maintain or recruit woody debris that provides cover and denning habitat. Coarse woody debris would be both consumed and created in fuel treatment areas, resulting in what is predicted to be relatively stable impacts to lynx denning habitat. In the short-term (less than 10 years), fuels treatments would reduce shrub cover and tree limbs that currently provide low, horizontal cover for snowshoe hares, but in the long-term (10 to 40 years), shrubs would re-grow and trees would regenerate, developing higher quality horizontal cover than is currently present.

Quantitative- Fuels treatment in units with modeled habitat would maintain grass or shrub lands across up 415 acres that should improve snowshoe hare summer habitat. Additionally, prescribed burn units include 660 acres of modeled forested lynx habitat that should result in habitat maintenance or improvement. Table 11 shows the amount of lynx habitat in potential burn areas. Shrubs will sprout and vigorously grow post fire treatment where they currently exist, but there will likely be a season or two of time where shrub heights are not adequate for snowshoe hare. Grass will be maintained and in patches of trees, you will see some mortality (approximately 40-60%), that would provide for woody debris recruitment. Fire will act as a site preparation tool, exposing bare mineral soil and creating an optimal seedbed for establishing conifers and shrub species. Tree species recruited will be dependent on canopy cover and species tolerance to shade (from least shade tolerant to most: larch, aspen, ponderosa pine, white pine, lodgepole pine, Douglas-fir, Englemann spruce, subalpine fir, grand fir, western

hemlock, western redcedar). Table 11 shows the best available estimates, based on a 'worst case scenario' or highest impact, of potential project effects to habitat. However, the exact extent of actual lynx habitats that would



Figures 24, 25, 26 and 27. Area Where Leave Tree Retention Species Preference Will Be Applied to Avoid Precluding Lynx Habitat Development

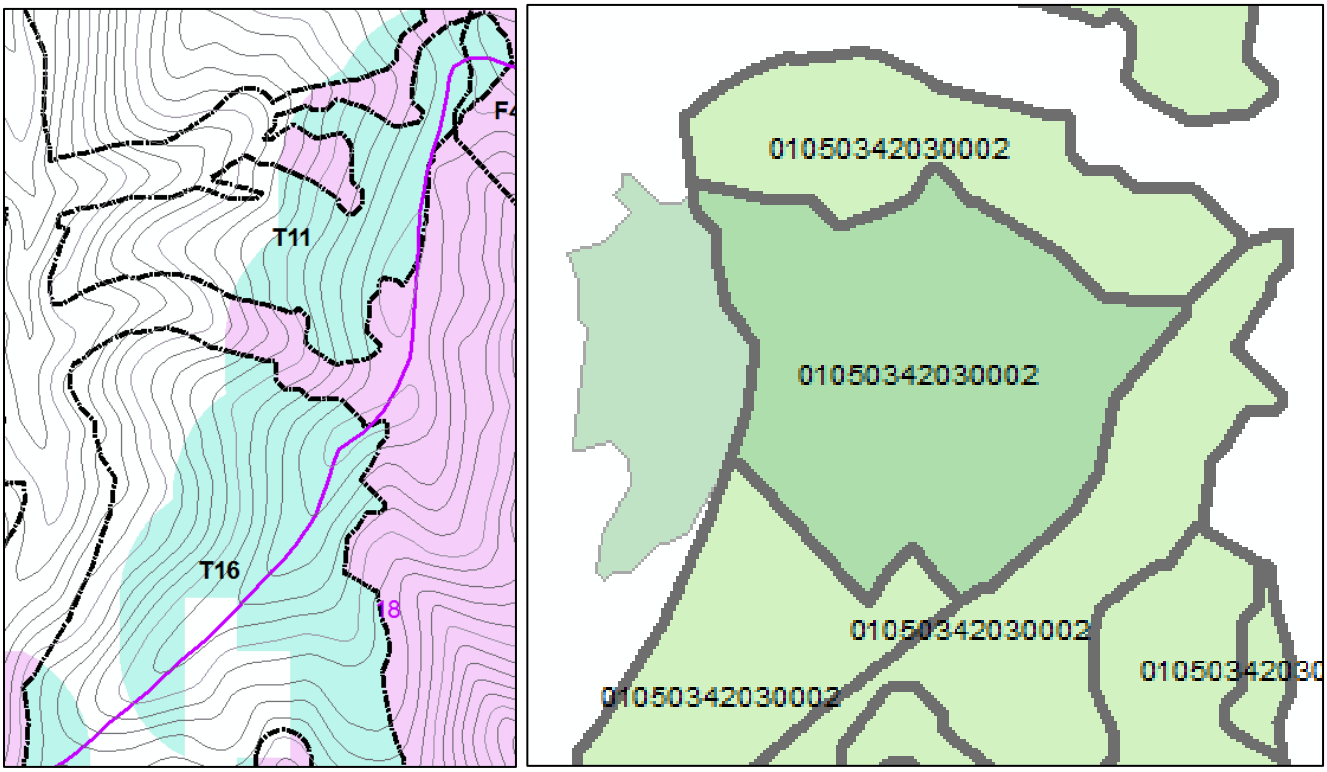
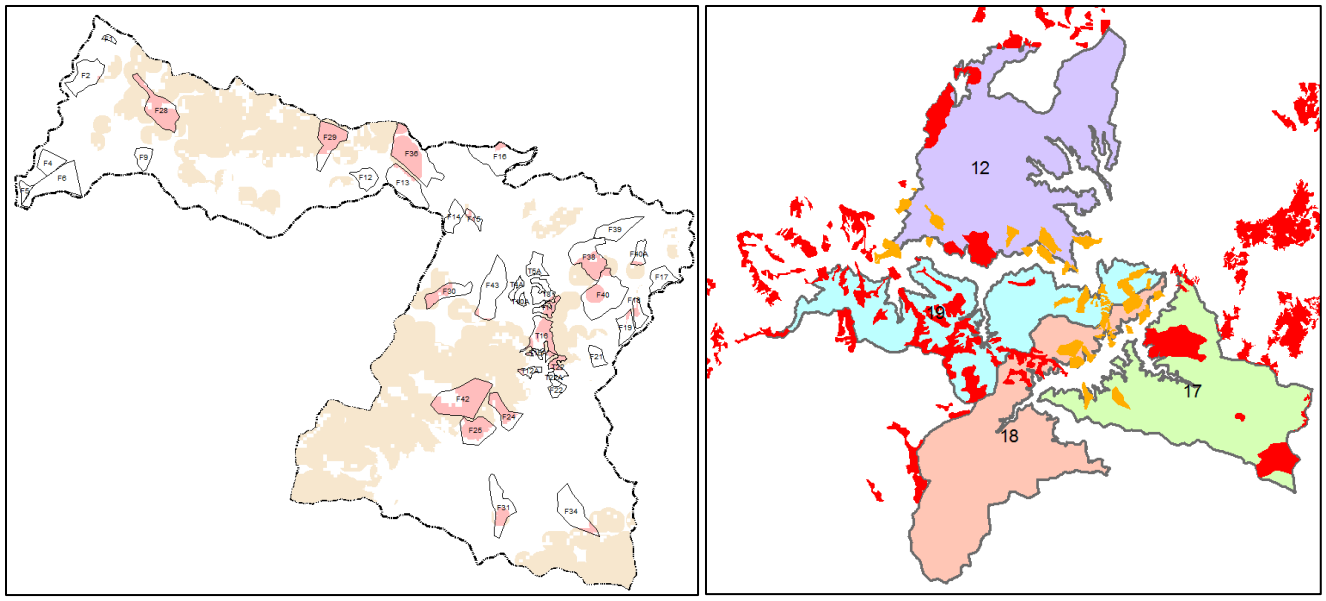


Figure 28. Lynx Habitat in Proposed Action and Figure 29. Lynx Analysis Area and Ongoing Actions (red) with Proposed Action (orange).



be affected and the nature of those effects are difficult to determine given the lack of a validated habitat model and broad assumptions surrounding the unpredictable nature of fire behavior.

Table 11. Fuels Treatment Overlap with Mapped Habitat Acreage (% of Suitable Habitat).					
LAU	*12*	*17*	*18*	*19*	*Totals (% Project)*
Denning	7 (1)	24 (1)	50 (1)	3 (0)	84 (4)
General	445 (5)	26 (0)	357 (3)	165 (3)	993 (15)
Total (per LAU)	452 (5)	50 (0)	408 (2)	168 (2)	1,077 (13)

Compliance with Objectives, Standards, & Guidelines

The Project is consistent with the Northern Rockies Lynx Management Direction, in that the standards and guidelines are met in each respective LAU.

Objectives

The proposed action aims to manage vegetation to mimic or approximate natural succession and disturbance processes. The project would meet all relevant objectives through maintaining habitat components necessary for the conservation of lynx (VEG O1). The result of the action should enhance provisions of a mosaic of habitat conditions through time. Dense horizontal cover would increase in the long-term to support high densities of snowshoe hare. Winter snowshoe hare habitat would remain available in both the SISS and in mature, multi-story conifer vegetation (VEG O2). The proposed action would conduct fire use activities to restore ecological processes and maintain or improve lynx habitat (VEG O3). Some of the vegetation management focuses in areas that have potential to improve winter snowshoe hare habitat, but presently have poorly developed understories that lack dense horizontal cover (VEG O4). It is difficult to show how the objective to maintain or restore lynx habitat connectivity in and between LAUs, and in linkage areas (ALL O1) would be met. Despite the existing limitations of the available habitat connectivity between LAUs and in linkage areas (the nearest being 7 miles

west of the analysis area), connectivity should be maintained similarly to current conditions at the landscape level, but not restored.

Guidelines
VEG G1 would be met because the regeneration harvest portion of the proposed action targets stem-exclusion, closed-canopy structural stage stands for treatment, which would promote dense conifers and shrubs. VEG G4 would be met because permanent firebreaks would not be constructed on ridges or saddles and no permanent travel routes that facilitate snow compaction would be created. HU G6 would be met because no unpaved roads would be upgraded to maintenance levels 4 or 5 with this project. However, increased human activity, traffic speed, and volumes may result from road improvements for a short-term post-implementation. HU G7 would be met because no new permanent roads would be built. However, one temporary road would be built, and one existing closed road would be used on a ridge off a saddle, but they would be abandoned or decommissioned after use, so effects would be short term. HU G9 would be met because public motorized use should be restricted on new roads built for projects, and when the project is over, these roads would be reclaimed, decommissioned, or placed in long-term storage. HU G8 would be met because brush cutting along low-speed, low-traffic-volume roads would be done to the minimum level necessary to provide for public safety. The current status of VEG G5 and VEG G11 is difficult to assess, but it is anticipated that habitat for alternate prey species should be provided in each LAU (VEG G5) since the proposed action would diversify the vegetation types in the project area. However, the local status of red squirrel, considered a primary alternate prey base, is unknown. Additionally, it is unknown how well quality denning habitat is distributed in each LAU (VEG G11), as in it is unknown if or where there may be pockets of large amounts of large woody debris in each LAU, but some denning habitat attributes would be maintained per Wildlife Project Design Feature #3. Additionally, 91% of the modeled denning habitat in the project area would not be treated, and residual trees in treated areas could provide a source of woody debris in the future.

Standards
ALL S1 would be met because there is no new or expanded permanent development proposal and this vegetation management project should maintain habitat connectivity similarly to existing levels in the respective LAUs. VEG S1 would be met because no LAUs have more than 30 percent of the potential lynx habitat currently in a SISS that does not yet provide winter snowshoe hare habitat, and no additional habitat would be regenerated by vegetation management projects that would result in exceeding the 30 percent SISS standard per LAU (Table 12). Additionally, fuel treatments would not result in more than three adjacent LAUs exceeding the 30 percent of potential habitat per LAU in a SISS that does not yet provide winter snowshoe hare habitat. VEG S2 would be met because this timber management project would not result in regeneration of more than 15 percent of lynx habitat on NFS lands within each LAU in a ten-year period. VEG S6 would be met because this vegetation management project would not reduce snowshoe hare habitat in multi-story mature or late successional forests.

Table 12. Percent of Lynx Habitat per LAU in a SISS that Does Not Yet Provide Winter Snowshoe Hare Habitat (VEG S1).

LAU	*12*	*17*	*18*	*19*
Current % SISS	16	5	11	22
Post Project % SISS	16	5	12	23

North American Wolverine. *Habitat Modification:* Land management is not considered a threat to wolverine, because few effects to wolverine have been documented from land management actions such as timber harvest and prescribed fire. Additionally, there are examples where wolverine used recently logged areas and recently burned areas despite the loss of canopy cover. Burning or regenerating wolverine modeled habitat, would result in alteration of type, quality, and availability of habitat conditions.

Disturbance: The project would have little risk of adverse effects to individuals and the current population trend should not be affected because of the limited scale of the project in relation to the large size of a typical wolverine territory and the abundance of suitable habitats that would not be affected.

Summary: The project will not contribute to the identified primary or secondary threats to the wolverine DPS. None of the proposed activities are considered a threat to the DPS. Individual project activities and cumulative actions will result in relatively small-scale disturbances in relation to the large wolverine home range size. The Project would not result in barriers to dispersing individuals. In conclusion, the Project would not likely jeopardize the continued existence of the distinct population segment of the North American Wolverine.

Grizzly Bear. There would be no Project effects on grizzly bear or their habitat because they are unlikely to be residents of the area and the Forest is not recognized as having any occupied habitat or habitat that is necessary for the recovery of the species.

B. Botanical ESA Species

Whitebark pine. Listing of whitebark pine as threatened or endangered was found to be warranted by the USFWS, but precluded by higher priority actions, and so the species was added to the candidate list on July 19, 2011 (76 FR 42631).

Whitebark pine are widely distributed at high elevation sites in much of western North America, including sites in Idaho (including portions of the Forests and North Fork Ranger District) above about 7,000 feet in elevation. The species appears to be in a range-wide decline primarily due to white pine blister rust and, more recently, mountain pine beetle infestations and climate change.

Elevations on the project area generally do not reach suitable elevations to support whitebark pine, though a few acres do occur: the project area tops out at 6,937 feet (at the Moose Creek Butte summit) along the ridge on the northern project boundary; this limited area is not proposed for any management activity. The highest vegetation management unit (F28) tops out a little less than 6,600 feet.

Because of the location of the project, the proposed action as described in Section III would have **no effect** on whitebark pine.

VII. CUMULATIVE EFFECTS

The Endangered Species Act (ESA) defines cumulative effects (50 CFR 402.2) as the additive effects of state and private activities that are reasonably certain to occur in the watershed where the Federal Action occurs. Under the ESA, an analysis of cumulative effects on ESA-listed species and their critical habitat is relevant only in determining whether the continued existence of a species would be jeopardized or whether critical habitat would be adversely modified or destroyed. No ESA-listed species or critical habitat would be affected by the proposed action to the point that the continued existence of the species would be jeopardized or critical habitat would be modified, so a cumulative effects analysis under the ESA is not relevant to these species.

VIII. DETERMINATION AND RATIONALE

A. Endangered Species Act Listed and Candidate Species

Implementation of the proposed action "**may affect**," but is "**not likely to adversely affect"** bull trout. This determination is based on the conclusion (discussed in Section VI) that individuals of the species would be unlikely to be harmed or harassed by the proposed activities. This is chiefly because bull trout would be unlikely to occur in proximity to project activities, would likely not be directly harmed by these activities even if one or a few individuals are in proximity to project activities, and because transmission of contaminants or fine sediment to stream channels in any large quantities should not occur. Habitat for bull trout will be maintained with essentially no biologically significant impacts, while prey base and reproductive success will not be impacted.

Although individual bull trout and designated bull trout Critical Habitat (CH) are present within or at the margins of the project area, proposed project activities are located, timed, designed, and mitigated in ways that would reduce the potential for adverse effect to a discountable level or likelihood. So, as described above, no measurable effects of the proposed project should be transmitted to bull trout or adversely affect the Primary Constituent Elements and so the proposed project "**may affect**," but is "**not likely to adversely affect"** bull trout critical habitat.

The Federally listed threatened, endangered, or proposed terrestrial wildlife species considered for this Project include Canada Lynx, Grizzly Bear, and North American Wolverine. Canada lynx are threatened, but it was recently determined they may no longer warrant protection under the Endangered Species Act due to recovery, so a proposed rule will be developed to follow through with the recommendation to delist the species (USFWS 2017). There are observation records and/or modeled habitat of all three species in the project area. This biological assessment provides species specific synopses on what is known about the local affected environment and itemizes environmental consequences. The proposed action "**may affect**," but is "**not likely to adversely affect"** the Canada lynx. This determination is based on the limited severity of the effects given the context, as well as on compliance or consistency with Northern Rockies Lynx Management Direction objectives, standards, and guidelines. Additionally, the project would have relatively short-term disturbance impacts and relatively small scale habitat modifications. The Project would have "**no effect"** on Grizzly Bear and would "**not likely jeopardize**" the North American Wolverine. These determinations are based on the lack of threats in the proposed action, as well as scope and scale of the action relative to the species' mobility and home range sizes.

Implementation of the proposed action would have "**no effect"** on whitebark pine. This determination is based on lack of individuals of these species in the project area.

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